MARCH 17, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

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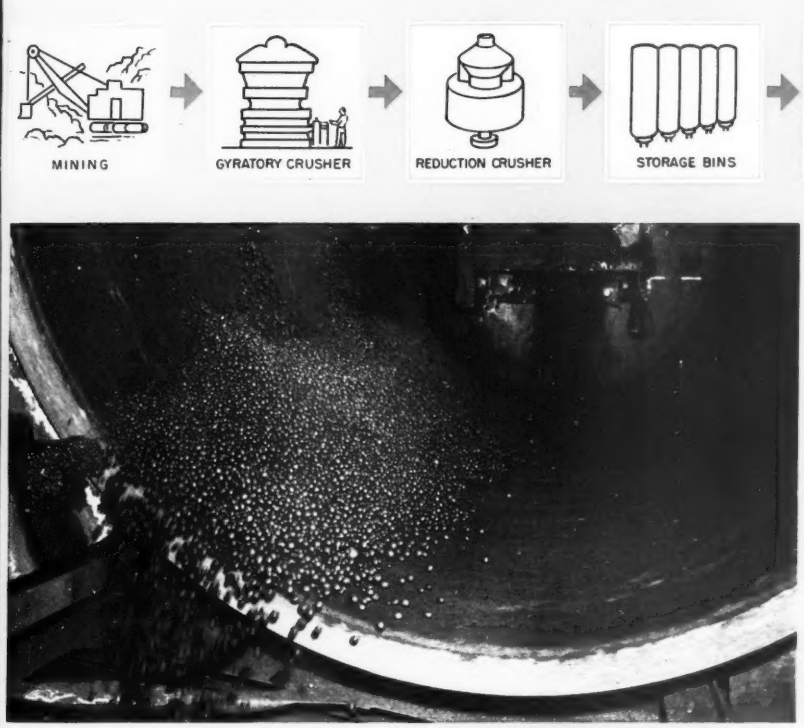

TACONITE, after a series of beneficiating processes, becomes powdery iron concentrate that rotates into pellets in this balling drum . . .

THERE'S A TREASURE IN TACONITE—page 65

STEEL STRIKE?
—Preparations Are Ominous, p. 55

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Let's take a closer look at your MACHINING REQUIREMENTS

Since machining is probably the most widely used method of producing hollow parts from steel tubing, keeping well-informed calls for periodic review of the characteristics of tube machining operations and new developments in this field. A new slant on types of tubing, grades of steel, mechanical properties and dimensional tolerances could show you the way to reduce overall time and costs.

Because B&W's long experience has *proved* the value of never-ending investigation to find *new uses for tubing's adaptability*, B&W keeps reminding people who work with metal that tubing is more than bar stock with a hole in it; it is a semi-finished product.

If there's a machining question on your mind these days, why not drop us a line? Tell us end-use of the mechanical tubing, OD, ID, and length of finished part, method of chucking and sequence of machining operations—description of finished product, dimensional accuracy and type of surface finish required. Send along a print if you like.

The B&W Technical Staff will supply objective recommendations and, if you desire, your regional B&W Tube Representative —Mr. Tubes—will step in to help interpret your needs to the home office. Bulletin TB-324 gives an idea of what can be done with fine tubing. Write for it.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION

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Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

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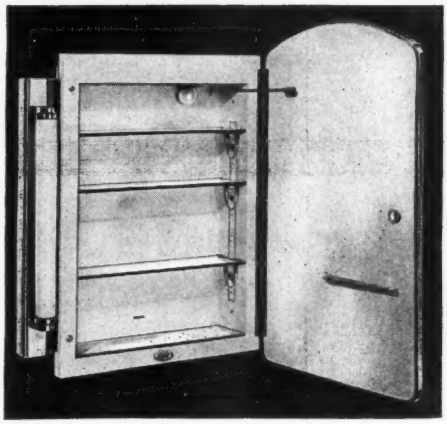
B&W SEAMLESS and WELDED TUBES

TA-1680M

Corrosion Was a Problem

UNTIL THEY SWITCHED TO MAYARI R



The medicine cabinets and waste receptacles in Bennett Manufacturing Company's line were originally made of mild carbon steel. And, like most products containing this grade of steel, they presented a corrosion problem. For instance, rust would often concentrate at one or two spots and cause considerable damage long before a receptacle or a cabinet had served its expected life.

To solve this problem and to improve their competitive position, Bennett began using low-alloy, high-strength Mayari R. This grade of steel was not expensive and it offered excellent resistance to corrosion. Longer life and all-around better service resulted—they have used Mayari R in their products ever since.

Tests show Mayari R to have from 5 to 6 times the atmospheric corrosion-resistance of plain carbon steel—and 2 to 4 times that of copper-bearing steel. Besides this, it retains paint 20 to 80 pct longer than carbon steel, depending, of course, upon the type of paint used.

No matter what you manufacture, it will pay you to investigate this versatile grade of steel. Our Catalog 259 explains in detail how Mayari R has been used to advantage in products ranging from locomotives to flatirons. Write for a copy.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

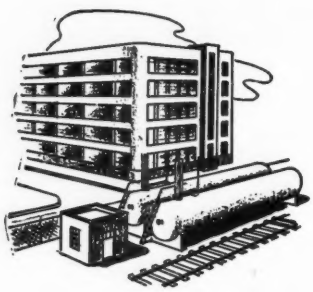
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Mayari R *makes it lighter... stronger... longer lasting*

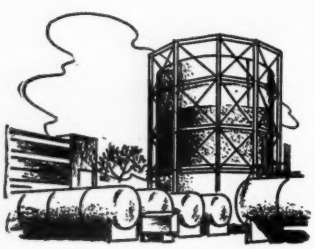
Philgas*

...A Uniform, Clean, Top-Quality LP-Gas



FOR INDUSTRIES

Leading industries use Phillips *66* Philgas successfully for heat treating, mold drying, core baking, ceramic firing and many, many other operations. Automatic Philgas systems assure constant furnace temperatures and atmospheres; constant pressures, high or low.



FOR UTILITIES

Many progressive utilities use Phillips *66* Philgas to augment natural or manufactured gas. High-quality Philgas is uniform in thermal value and gravity, and is free from harmful contaminants. Automatic operation cuts down on overhead.

*Philgas is the Phillips Petroleum Company brand name for its high quality propane-butane LP-Gas or bottled gas.

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Only with B. F. Goodrich grommet belts can you make these savings!

Save 3 ways! Investigate today! Write or mail coupon

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

What is a grommet?

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord *section* as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

All cords put to work

Each of the two grommets and every part of a grommet carry their share of the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

Better grip, less slip

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give ⅓ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

Send for proof

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases:

"... within a few days ordinary belts had stretched ... After six months of 24-hour-a-day service BFG grommet belts haven't stretched at all ..."

"Ordinary belts lasted only 5 or 6 weeks ... B. F. Goodrich grommet belts are in their sixth month of service ..."

"Previous belts suffered from shock loads, wore out fast ... BFG grommet belts have been in service 2 years with no shut-downs..."

There are hundreds of cases like these.

They cost no more

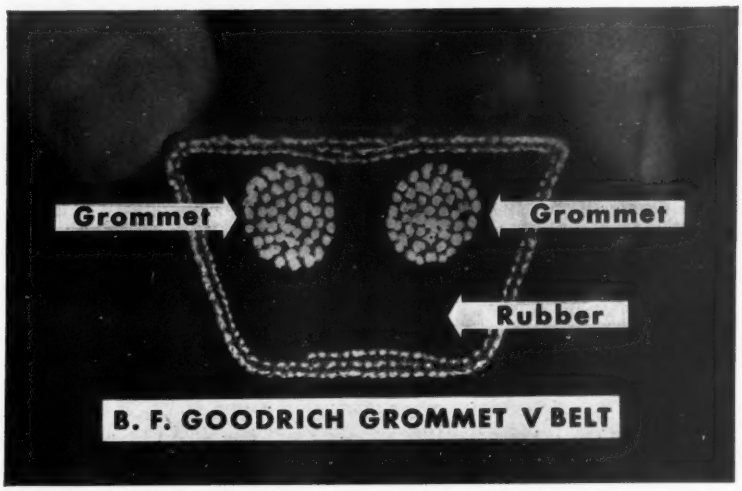
BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,233,294).

Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)

Grommet V Belts BY

B.F.Goodrich

FIRST IN RUBBER



The B. F. Goodrich Company
Dept. S-3
Akron, Ohio

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☐ Have distributor show me the "X-ray" belt that shows how B. F. Goodrich grommet belts are made.

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STEEL
The Weekly Magazine of Metalworking

VOL. 130 NO. 11 MARCH 17, 1952

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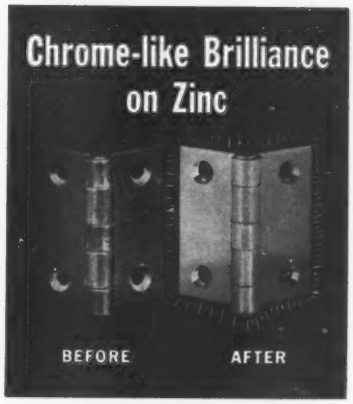
Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1952 by Penton Publishing Co.



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At less than 1/5¢ per square foot you can have brilliant finishes like this with Luster-on Utility bright dip for zinc. It's easy to apply and control and there's plenty available — no shortages. Every day former users of nickel and cadmium are converting to this passivating bright dip.

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- ✓Wire Goods
- ✓Refrigerator Shelves
- ✓Radio Speakers, Chassis, Shields
- ✓Television Parts
- ✓Electrical Parts
- ✓Air Conditioning Fans, Guards, etc.
- ✓Bolts, Nuts, Washers, etc.
- ✓Builders' Hardware
- ✓Outdoor Metal Articles (fences, trailers, etc.)

Also

Protective Finishes
Khaki Drab Luster-on

With 300 hours of salt spray resistance Luster-on Khaki Drab far exceeds U. S. Government Specifications of 96 to 100 hours. This chromate type conversion coating has been developed primarily for electro-deposited zinc plate. It is also ideal as a paint bonding treatment for later organic finishes.

SEND SAMPLES

Send us samples of your parts. Let us zinc-plate and LUSTER-ON treat them for you — at No Charge. This will show you how you can dress up and protect your product simply and inexpensively with Luster-on.

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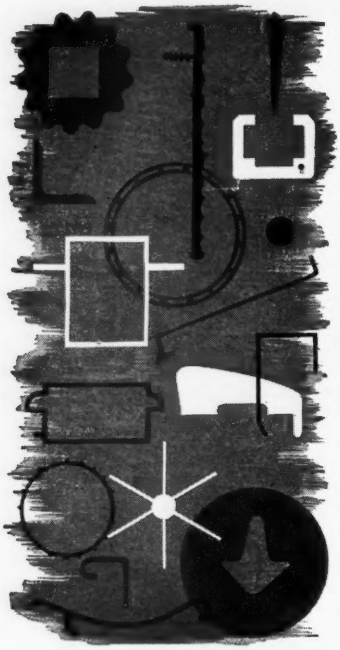

A profile of WERNER Aluminum Services

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A highly skilled, personalized service; direct teletype lines, and excellent forwarding facilities will expedite your order for:

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* *Names on request*

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Behind the Scenes...

Synonym

Milton A. Smith, assistant general counsel for the U. S. Chamber of Commerce, comes through with a replacement for "gobbledygook," the word coined by Maurie Maverick to describe official government language. The new synonym is "bafflegab," defined this way: Bafflegab is multiloquence characterized by consummate interfusion of circumlocution or periphasis, inscrutability, incognizability, and other familiar manifestations of abstruse expatiation commonly utilized for promulgations implementing procrustean determinations by governmental bodies.

Miss Welder

They've done it again. The National Eutectic Welders' Clubs have named a "Miss Welder of 1952." She's one Denise Darcel, described as "delightfully provocative and a movie, stage and television star." Last year Dagmar got the nod as "the girl we would like most to weld with."

Sound Advice

In the bulletin put out by R. C. Sollenberger for members of Conveyor Equipment Manufacturers Association is this advice:

If you cannot absolutely refrain from drinking, start a saloon in your own home. Be the only customer and you will not have to buy a license. Give your wife $12 to buy a gallon of whiskey. There are 128 snorts in a gallon. Buy all your drinks from your wife at 40 cents a shot and in four days when the gallon is gone, your wife will have $39.20 to put in the bank and $12 to buy another gallon. If you live ten years and buy all your liquor from your wife and then die with snake in your boots, she will have $35,750.40 on deposit, enough to bury you respectably, bring up your children, buy a house, marry a decent man and forget she even knew you.

Chaser

The amount of hot water used in one year by a family of three would float a submarine chaser. That is one of the findings of Bell & Gossett Co., manufacturer of hot water heating system equipment.

That may be true for some families of three, but not ours. Often when we come home at night after a day spent over a hot typewriter, we'd like a hot bath. Do we get it? No. The tank is empty. Therefore, we think we don't even come close to consuming the 25,000-40,000 gallons of hot water a year that Bell & Gossett says we do. Maybe we need a B. & G. hot water system.

Puzzle Corner

A slip of the typewriter—or maybe it was the mind—resulted in an incorrect answer in the Mar. 3 issue to the puzzle about the gun and the packing case published in the Feb. 18 issue. The container should have been one yard cubed, not one yard square as we intimated.

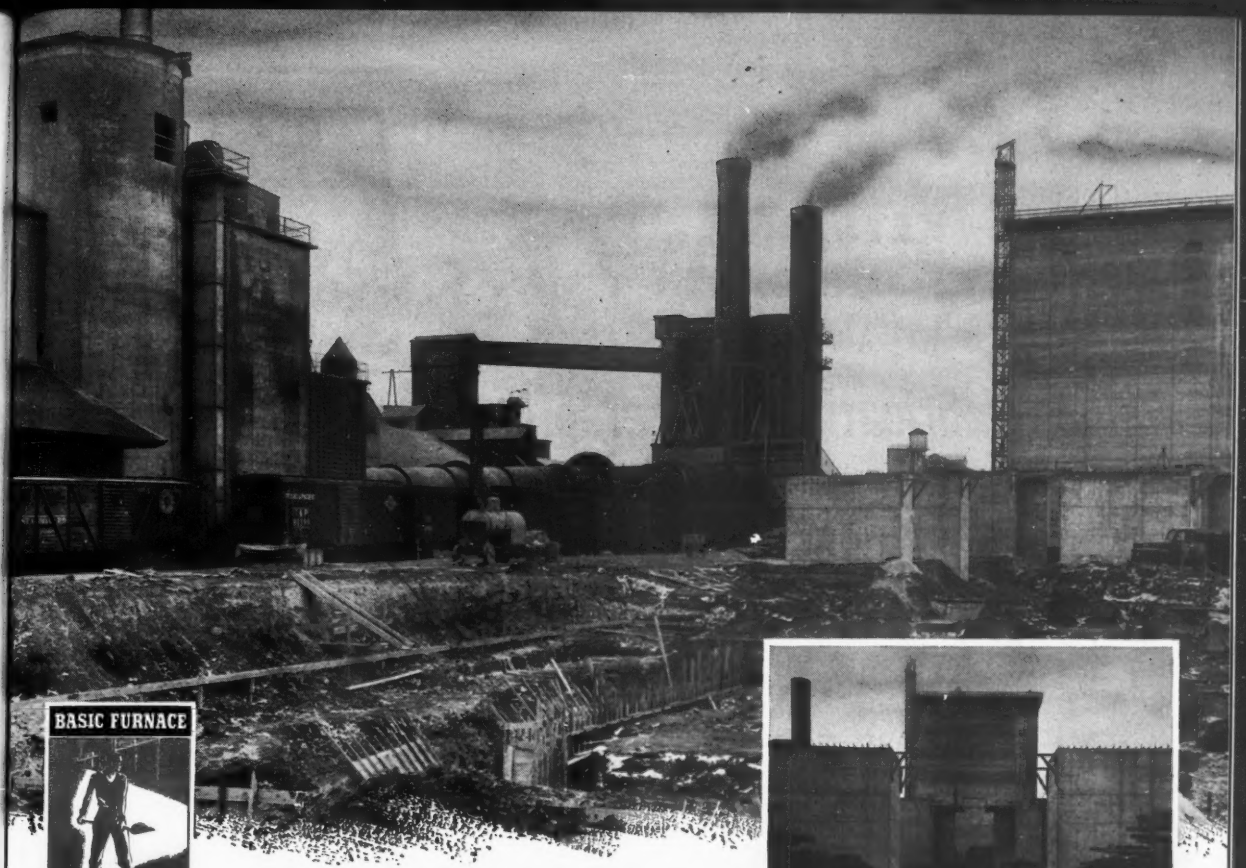
Sharp eyes that caught the inconsistency included those of C. A. Nichols of Peden Iron & Steel Co., Deane A. Millman of Eveleth, Burt, Rust - Burrows - Goff, Yawkey Mine Groups, J. A. Widmyer of Shenango Furnace Co. and G. P. Williams of Shell Oil Co.

For the Mar. 3 puzzle about the expanding plant, Messrs. Nichols Widmyer and Williams had the correct answer, as did H. C. Osborne of Racine, Wis., W. H. Miller of General Fireproofing Co. and Lewis D. Rice of Timken Roller Bearing Co. The one plant would cover the area in 29 days. The other plant would cover the other half in the same time. Hence the answer is 29 days.

Here's a puzzle submitted by STEEL's newest assistant editor, Bob Huber: Three passengers on a train—Messrs. Robertson, Smith and Jones—discover that three trainmen on the run have the same names as they do. Mr. Robertson lives in Detroit, Mr. Jones makes $2000 per year. The brakeman lives between Chicago and Detroit. Smith beats the fireman at golf. The brakeman's next-door neighbor, one of the passengers, makes three times as much as the brakeman who earns $1000 per year. The passenger who lives in Chicago has the same name as the brakeman. Who is the engineer?

Shrdlu

(Metalworking Outlook—Page 47)



BASIC FURNACE REFRACTORIES

Site of Basic Refractories' plant expansion at Maple Grove, Ohio. Two new rotary kilns and supplementary equipment are being erected. Photograph taken Jan. 25, 1952.

Close-up of twelve massive concrete piers on which the two 390-foot-long rotary kilns will rest.

As steel grows...

To improve on an old saying, "as steel grows, so grows the nation". And as steel grows, so must grow the basic refractories industry.

At Maple Grove, Ohio, Basic Refractories is expanding its capacity to produce dead-burned dolomite. Two new rotary kilns, larger than those you see in operation above, will soon double our output of Magnefer and Syndolag.

Steel kiln shells, trunnions and tires, delivered at the site early last winter, are now (mid-March) being positioned.

Raw dolomite storage silo, 122 feet high, tallest of its kind, erected in an 8-day period last December.

Basic Refractories Incorporated

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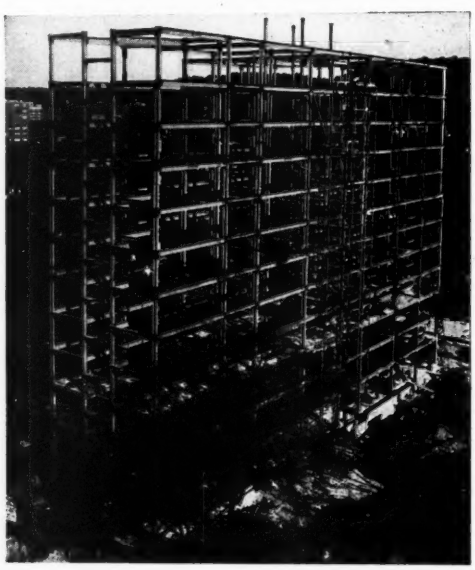

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To dust they shall return...

unless protected by INSUL-MASTIC COATINGS

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IRREGULAR SHAPES SUCH AS CAMS SHOULD BE ROUGH GROUND AT 15 TO 30 FEET PER MINUTE AND FINISH GROUND AT ONLY HALF THAT SPEED.
OUT OF BALANCE WORK SUCH AS CRANKSHAFTS MUST BE GROUND AT THE LOWER SURFACE SPEEDS OF 25 TO 45 FEET PER MINUTE
TO SOME EXTENT CHANGES IN WORK SPEED MAY BE RESORTED TO IN ORDER TO COMPENSATE FOR NOT HAVING A WHEEL OF THE CORRECT GRADE
58
51

- **It shows how to improve production with your present cylindrical grinders**
- **Shows how to cut grinding costs... improve quality... make grinding easier... avoid trouble**

"Better Grinding" is just the book you need to train young mechanics and machine operators or to give a "refresher" to veteran operators. It tells how to avoid trouble and do a better grinding job. The basic practical help in down-to-earth style covers setup, operation and maintenance of cylindrical grinders. Send for your copy of this short cut to higher shop efficiency, today!

- 17 chapters crammed with practical helpful grinding information.
- 90 two-color sketches show ways to prevent production bottlenecks.
- Sturdy, long-lasting cover, lays flat when open.

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Technical Data Department
LANDIS TOOL COMPANY
WAYNESBORO, PA.

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Company _____

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LANDIS
precision grinders

148A

MORE than a "Coolant" is needed

"COOLANT" is a misnomer as applied to *cutting fluids*. You won't get far with just a coolant. The fluid used for metal cutting must have multiple characteristics in order to provide the desired finish and tool life at the required production rate:

- **Cooling Action** — very necessary to carry away the heat generated by machining, but only part of the function.
- **Lubricity** — to reduce friction between the tool point and the work piece. The lubricating qualities of the cutting fluid make a big difference.
- **Anti-Weld Properties** — to prevent build-up of metal on the tool and scuffing of the work piece. The amount of anti-weld agent in the fluid is a critical factor and depends on the job.

These factors and others are all inter-related. Over-simplification of the subject and the cutting fluid can lead to trouble. Let a Stuart sales-engineer show you what can be accomplished with the *right* cutting fluid.

Ask for Bulletin

Get the Facts
Visit the
STUART BOOTH
No. 1823
at the
ASTE SHOW
Chicago, Mar. 17-21

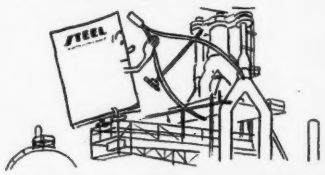
D.A. Stuart Oil co.

2735-37 S. Troy Street, Chicago 23, Ill.

TIME-TESTED
Cutting Fluids and Lubricants

LETTERS
TO THE EDITORS

How Much Pig Iron?



In December, 1947, you published a list of all blast furnaces and their capacities in the United States. Is there a later release of this information?

W. W. Phillips
Klein Steel Co.
Bellevue, O.

• *List of blast furnaces and their capacities was published in the "Steel Industry statistics" section of the Oct. 1, 1951 issue. A copy of that section has been forwarded. For latest listing of blast furnaces and capacities as of Jan. 1, 1952 and data on new capacity to come in next year see p. 51 of* STEEL*'s Mar. 3 issue.*

Credit Where It's Due

Thank you for the concise and attractive manner in which my article on desulfurization was presented in STEEL (Jan. 28, p. 76). The following credits were omitted:

L. F. Rains, A. M. Byers Co., Pittsburgh

Bo Kalling, Stora Kopparbergs, Domnarvet, Sweden

S. F. Carter, American Cast Iron Pipe Co., Birmingham, Ala.

Thurston Harwell, Linde Air Products Co., Birmingham, Ala.

E. N. Case, American Cyanamid Co., New York

W. W. Austin Jr., senior metallurgist
Southern Research Institute
Birmingham, Ala.

Help in Cutting Up

After reading your article "Rotary Cutting" (Jan. 28, p. 63) we would like to have more information on this cutting tool.

Charles E. Poehler
assistant superintendent
Aetna Ball & Roller Bearing Co.
Chicago

• *ASME paper on the Rotary Cutting Tool by M. C. Shal, P. A. Smith and N. H. Cook, has been forwarded.*

We'd like to have more information on the cutting torch that burns gasoline and oxygen ("Cuts with Gasoline", Dec. 24, p. 53).

A. E. Bond
works purchasing supervisor
Davenport Works
Canadian General Electric Co.
Toronto, Ont.

• *Contact J. A. Browning, Dartmouth College, Hanover, N. H.*

STEEL Goes 'Over There'

May we have an editorial index to Vol. 129 of STEEL as soon as it is available?

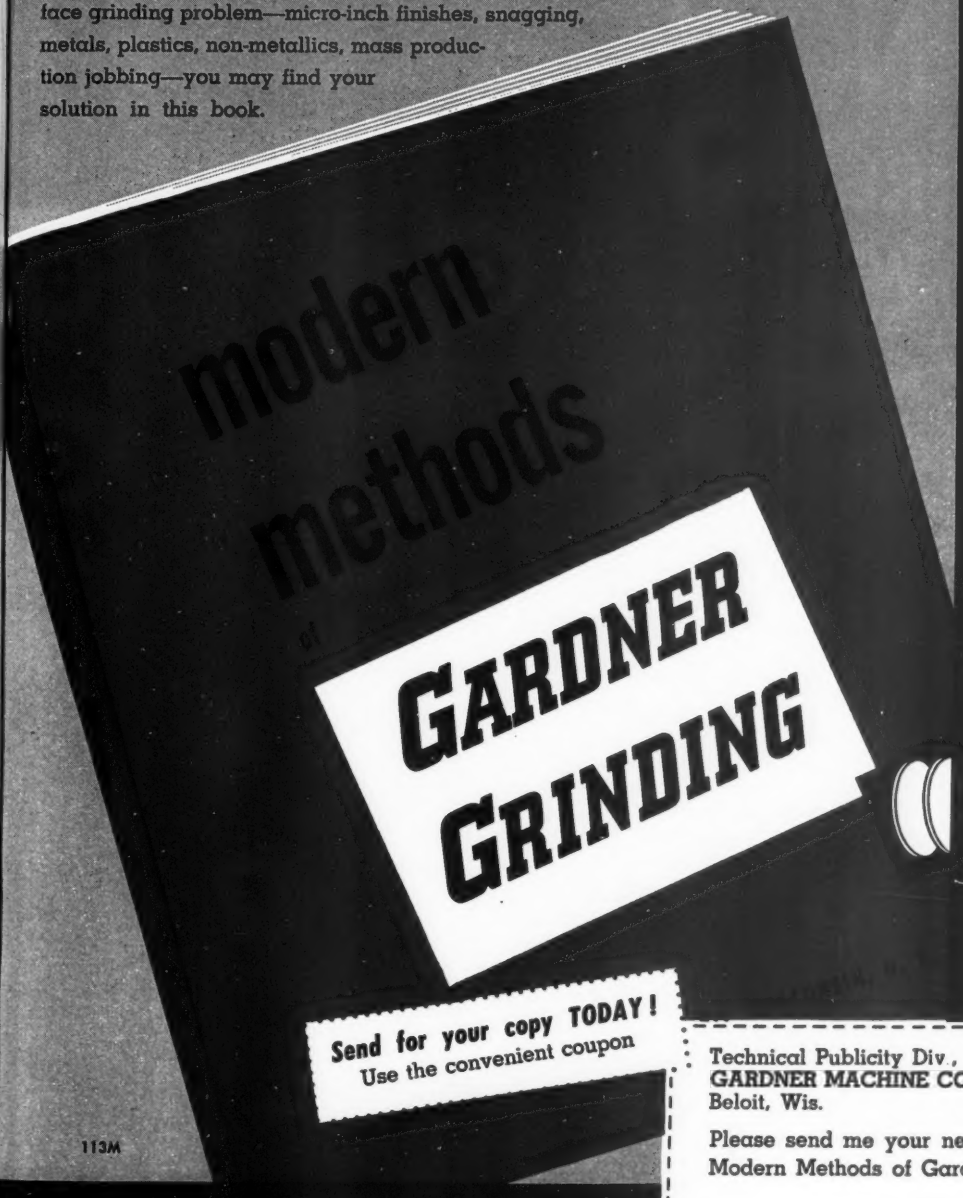
D. Eichard
Lysaght's Works Ltd.
Port Kembla Branch
Wollongong, Australia

• *It's on the way.*

If You Do Flat Surface Grinding...

Compare your operations with the 25 case studies described in this new book

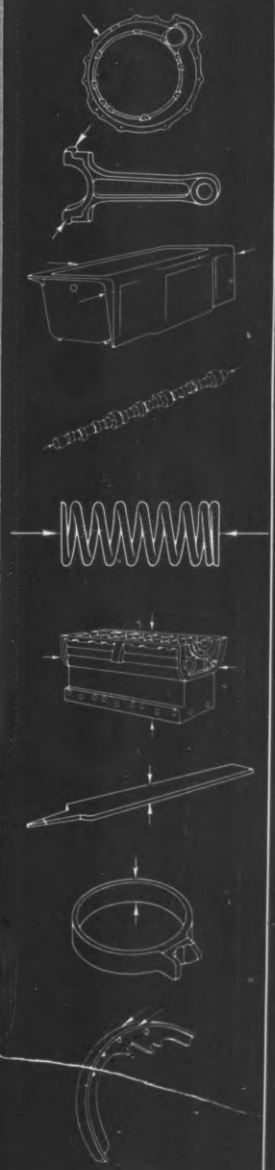
This book illustrates 25 case studies of disc grinding applications with Gardner Precision Disc Grinders. It includes production data, specifications and other important data. If you have a flat surface grinding problem—micro-inch finishes, snagging, metals, plastics, non-metallics, mass production jobbing—you may find your solution in this book.



Send for your copy TODAY!
Use the convenient coupon

113M

Typical Work Pieces ground on Gardner Grinders



Technical Publicity Div.,
GARDNER MACHINE COMPANY
Beloit, Wis.

Please send me your new publication
Modern Methods of Gardner Grinding

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TITLE _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

NOW REMOVE RUST FAST WITHOUT ACIDS!

WITH

Enthone

ALKALINE DERUSTING COMPOUND 134

Do You Know What This Means?

1. Absolutely no tarnishing, etching or darkening of steel during derusting.
2. Clean and derust in one operation.
3. Reclaim rusty tools, gears and delicate threaded parts.
4. No acid or corrosive fumes around.
5. Greater adhesion of chromium, silver and nickel electrodeposits — also vitreous enamels.
6. Derust high carbon steel, cast and malleable iron and leave a white clean surface.
7. Derust coppered, galvanized and tinned surfaces without stripping the copper, zinc or tin, e. g. milk cans.
8. Pickle **fast** at room temperature.
9. Clean, derust and deposit zinc or cadmium plate **in one operation.**

Write for literature on this new discovery and also get the Enthone check list of 60 new research products for metal finishing.

METAL FINISHING PROCESSES

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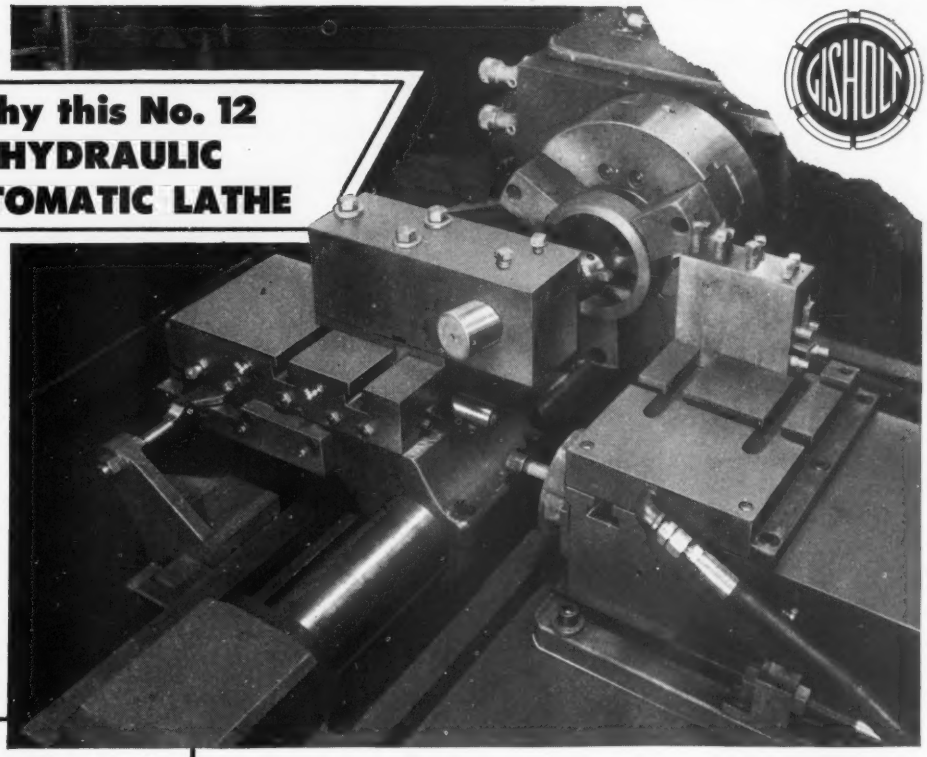
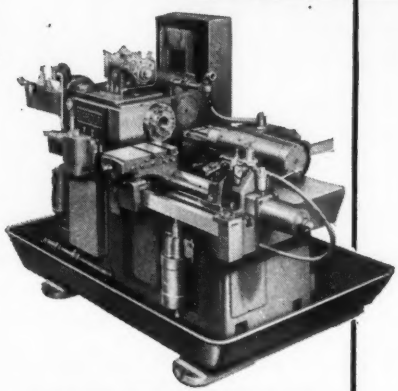
ELECTROPLATING CHEMICALS

why this No. 12 HYDRAULIC AUTOMATIC LATHE





The Gisholt Hydraulic Automatic Lathe is a genuinely rugged 12" lathe, suited for light, fast jobs. Handles chucking, between centers, or fixture-held work.

maintains GREATER ACCURACY

Here, feed pressures are applied directly to tools without intermediate cams, arms or other linkage. Accuracy is further insured by feeding against dead stops. In all cuts there is a moment of dwell during which cuts are cleaned up.

Front carriage is mounted on and driven by the massive bar to which it is clamped. Wide lateral support of carriage assures rigid alignment without tremble or tremor.

Movement of the massive rear slide is by hydraulic piston in the base of the slide itself.

Both carriages are directly supported by the massive integrally cast cabinet type bed, and all bearing surfaces, ways and gibs are hardened and ground steel to assure permanent accuracy.

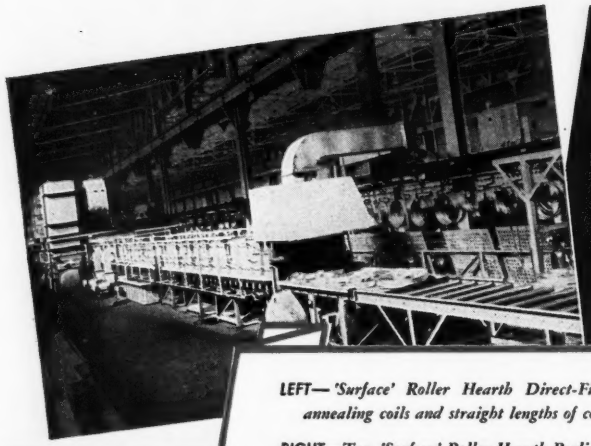
THE GISHOLT ROUND TABLE

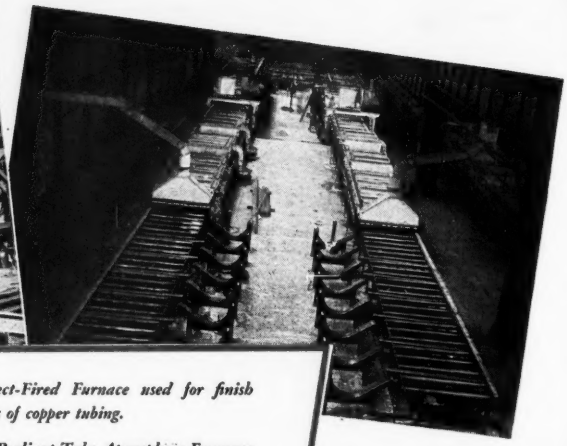
represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

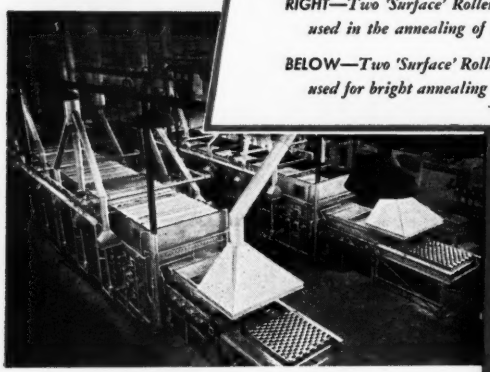




LEFT—*'Surface' Roller Hearth Direct-Fired Furnace used for finish annealing coils and straight lengths of copper tubing.*

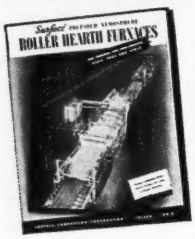
RIGHT—*Two 'Surface' Roller Hearth Radiant Tube Atmosphere Furnaces used in the annealing of welded aircraft tubing.*

BELOW—*Two 'Surface' Roller Hearth Radiant Tube Atmosphere Furnaces used for bright annealing of steel cartridge cases.*



'SURFACE' Roller Hearth FURNACES

Radiant Tube and Direct-Fired



Send for Bulletin SC-132 today! Describes both Radiant Tube and Direct-Fired Roller Hearth furnaces as applied to numerous heat treatment operations.

For annealing, normalizing, clean hardening and many other heat treating processes on tubing, coils, disks and sheets. Ideal for small and large parts, such as shell cases, which are readily moved in baskets or trays.

ENGINEERING FEATURES

HEATING—direct-fired or radiant tube, as required, to provide uniform temperature and uniform heat distribution throughout the furnace.

ATMOSPHERE CONTROL—Gas-tight construction and radiant tube heating permit precise control of furnace atmosphere.

EXCLUSIVE MECHANICAL CONSTRUCTION—Rollers designed with external bearings and drives provide uniform speeds and hearth alignment with minimum maintenance.

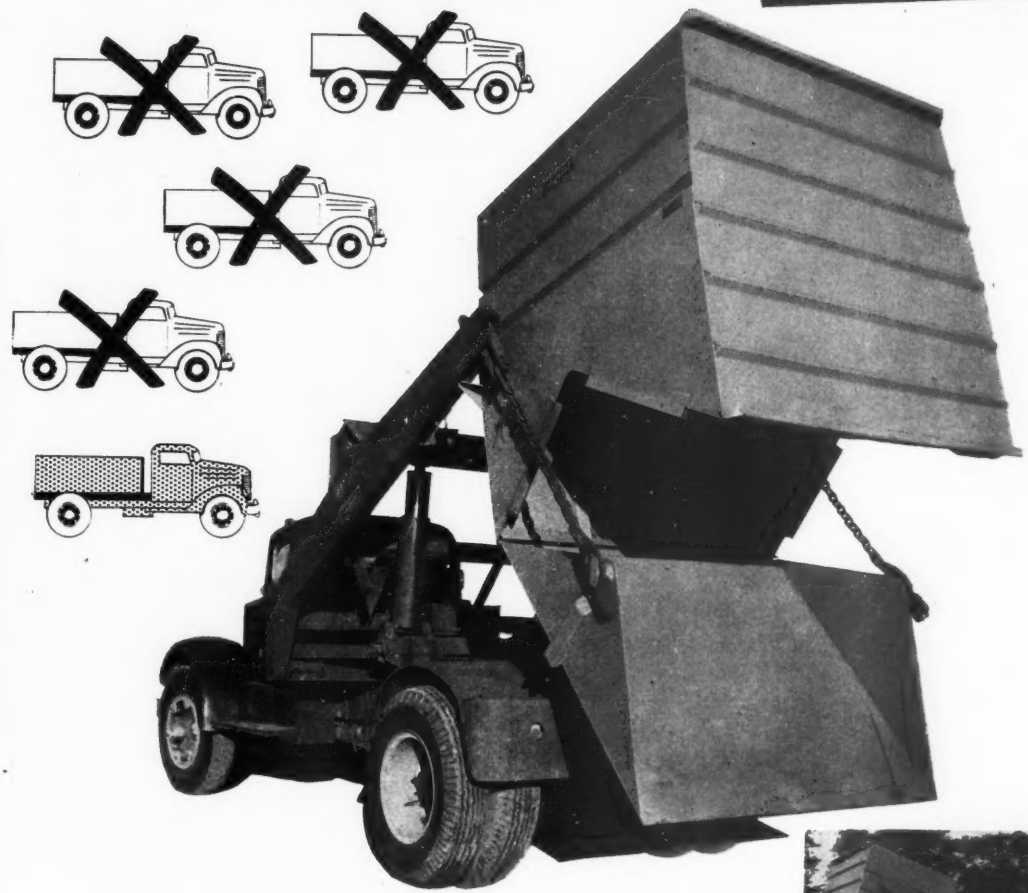
The direct result of these and other 'Surface' features is *near-standardization by steel and nonferrous metal processors on Surface Combustion Roller Hearth Furnaces.*

'Surface' INDUSTRIAL FURNACES

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

You Can Do The Work of 3 to 5 Conventional Trucks With Only One ——

DEMPSTER DUMPSTER
TRADE MARK REG.



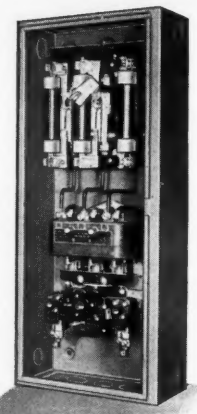
In many plants handling materials by the Dempster-Dumpster System, one truck-mounted Dempster-Dumpster, operated by only one man, the driver, has replaced 3 to 5 conventional trucks and crews. One Dempster-Dumpster services a multiple number of detachable containers in a wide variety of designs best suited to the type of materials handled—be they bulky, light or heavy . . . solids or liquids . . . trash or rubbish. Containers are conveniently located at accumulation points inside and outside buildings. The Type LFW Dempster-Dumpster shown above handles containers up to 12 cu. yds. Containers up to 21 cu. yds. are available with our Type ARLF and DTLF Dempster-Dumpsters. Without question, the Dempster-Dumpster System is the most economical and most efficient method of plant materials handling by truck yet devised! Write today for complete information. Manufactured exclusively by Dempster Brothers, Inc.

DEMPSTER-DUMPSTER, operated by means of hydraulic controls in cab, picks up each container, hauls and empties it or sets load down intact.

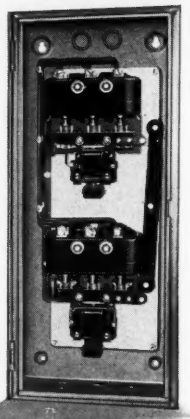
DEMPSTER BROTHERS, 632 Dempster Bldg., Knoxville 17, Tenn.

CLEAR ACROSS THE BOARD . .

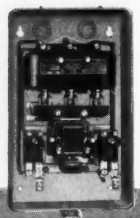
CLARK Type "CY" starters, sizes 2 and 3—employing the new principle of arc interruption—are offered in a wide range of models, for every application within their horsepower limits. A few of the many available are shown here. Enclosure styles include NEMA Types 1, 1A, 4, 5, 7 and 9.



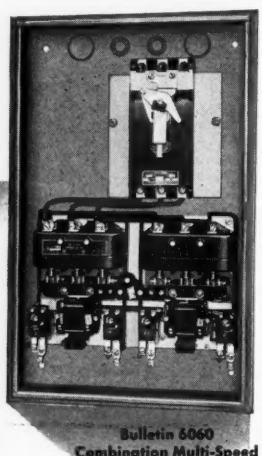
Bulletin 6018
Combination Non-Reversing
AC Magnetic Starter
with Fusible Disconnect Switch



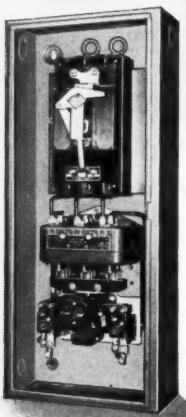
Bulletin 6031
Reversing
AC Magnetic Starter
without Overload Protection



Bulletin 6013
Non-Reversing
AC Magnetic Starter



Bulletin 6060
Combination Multi-Speed
AC Magnetic Starter
with Circuit Breaker



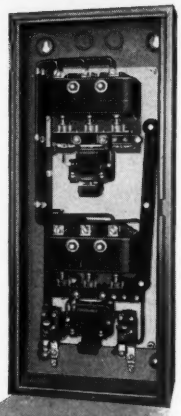
Bulletin 6020
Non-Reversing
AC Magnetic Starter
with Air Circuit Breaker

CLARK Type "CY" Sizes 2 & 3 —the starter with the revolutionary new arc-quenching principle.

The arc is extinguished by the effect of blow-out coils, *concentric with the contacts*. The steel arc chamber and center stud (colored blue in sketch at right) form the magnetic field which rotates the arc—either lengthening or confining it. Since the arc moves continuously on the contact surfaces, burning and pitting is minimized and contact life greatly increased.

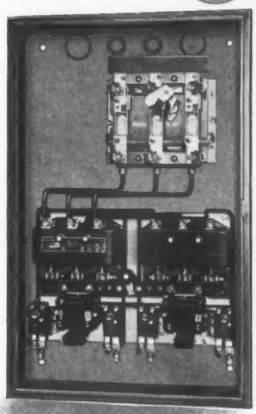
THE CLARK CONTROLLER CO.

...CLARK Type "CY" AC MAGNETIC MOTOR STARTERS



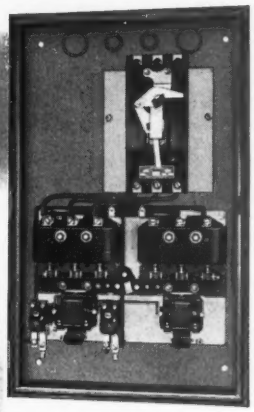
Bulletin 6030
Reversing AC
Magnetic Starter

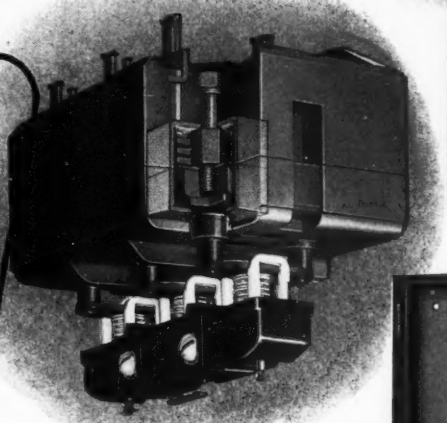
Every CLARK Type "CY" Starter gives you the extra protection of "Mill-Type" heavy-duty construction, *plus* the use of strong multi-turn magnetic blowouts in sizes 2 and 3, *plus* twin-break contacts of special silver alloy, *plus* advanced design with many exclusive features to improve efficiency and reduce maintenance.



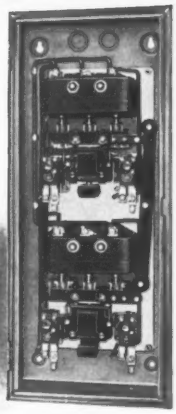
Bulletin 6058
Combination Multi-Speed
Magnetic Starter with
Safety Switch

Bulletin 6040
Combination Reversing
AC Magnetic Starter
with Air Circuit Breaker

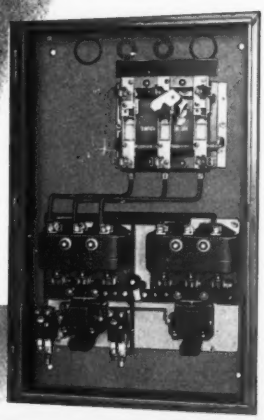




Working Heart of the CLARK Type "CY" Starter with cut-away showing magnetic circuit, arc shield and blow-out coil.



Bulletin 6050
Multi-Speed AC
Magnetic Starter



Bulletin 6038
Combination Reversing
AC Magnetic Starter
with Disconnect Switch

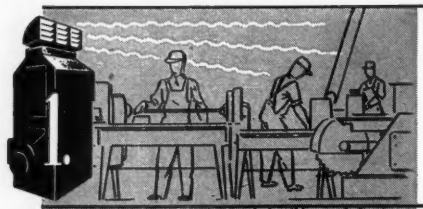
If your plant uses AC motors, it will pay you to learn how CLARK Type "CY" starters can insure production and cut maintenance costs. Write for complete details

ENGINEERED ELECTRICAL CONTROL
1146 EAST 152ND ST., CLEVELAND 10, OHIO

HERE ARE *5 ways* →

A DRAVO *Counterflo* HEATER* CAN WORK FOR YOU!

*DIRECT-FIRED

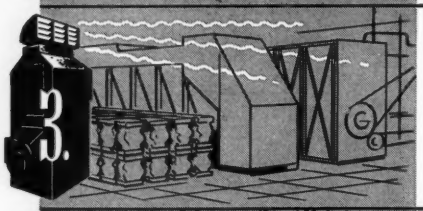


COMFORT HEATING *(commercial and industrial)*

Dravo Heaters have a 150-foot air throw and recirculate warm air at the working level, giving maximum comfort with minimum roof heat loss. No expensive pipe covering, radiators or ducts required. Quick warm-up; automatic on-off or modulating controls.

TEMPERING MAKE-UP AIR

Where dust-filled or fume-filled air must be removed from a building by exhausters, this air can be replaced and tempered by Dravo Heaters. Equal pressure is maintained . . . working conditions are kept comfortable.

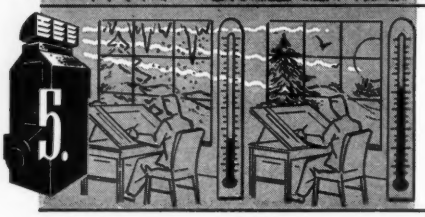


HEAT CURING

Dravo Heaters can be used independently or in combination with other equipment for process curing concrete, plastics, paper, fibre containers, rubber and many other products. Automatic temperature controls keep air flow at desired temperature.

PROCESS DRYING

Moisture content of air can be controlled or removed entirely by using fresh or recirculated air. Immediate response to temperature controller demand makes it ideal for drying paint, farm crops, wood products, rugs (after cleaning) and many other processes.



YEAR-'ROUND VENTILATION

In addition to comfort heating, Dravo Heaters provide fresh-air ventilation in warm weather and can be easily tied in with air-conditioning systems.

DRAVO HEATER *Plus* VALUES . . .

- Low initial cost . . . users report 30% to 60% savings on installation.
- Direct-fired . . . low fuel consumption . . . burn gas or oil . . . readily converted.
- Long service life, low maintenance . . . stainless steel combustion chamber eliminates refractory lining.
- Easily moved to any location to fit your requirements.
- Flexibility . . . can be mounted horizontally or vertically on floor, walls or ceiling.
- Available in sizes from 400,000 to 2,000,000 Btu/hr.

WRITE FOR MORE INFORMATION. It's worth your while to look into Dravo *Counterflo* Heaters for any of these five functions shown above. You'll be glad you did. Ask for Bulletin No. ST-526

DRAVO CORPORATION

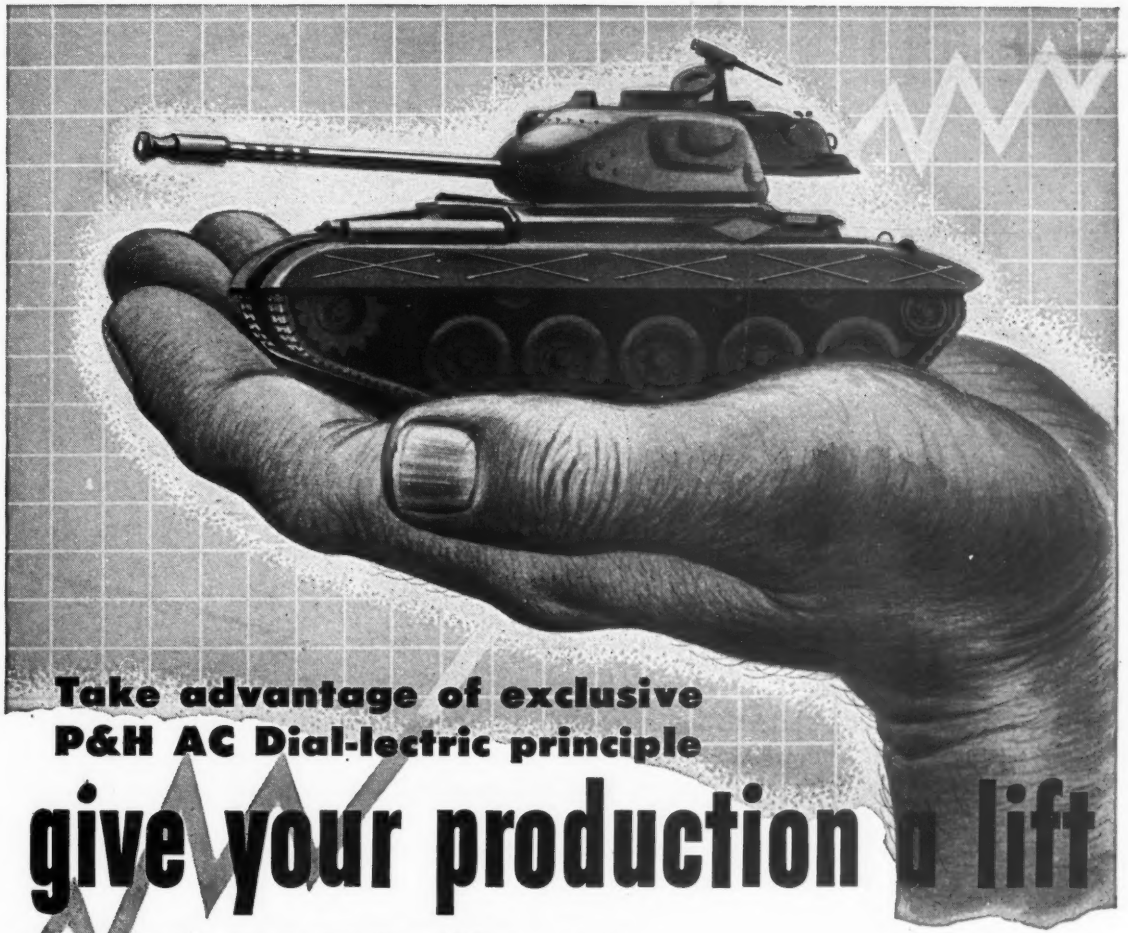
HEATING DEPARTMENT
Dravo Bldg., Fifth & Liberty Ave.
PITTSBURGH 22, PA.

ATLANTA • BOSTON • CHICAGO • CLEVELAND • DETROIT • NEW YORK • PHILADELPHIA • PITTSBURGH
Sales Representatives in Principal Cities

DRAVO

Manufactured and sold in Canada by Marine Industries, Ltd., Sorel, Quebec

Export Associates: Lynch, Wilde & Co., Washington 9, D.C.



Take advantage of exclusive P&H AC Dial-lectric principle

give your production a lift

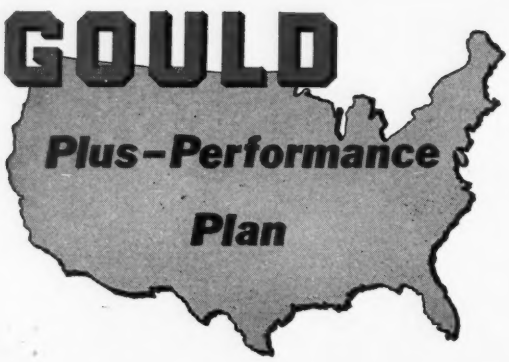
— with safe, open-circuit voltage . . . easy, quick-start arc . . . time-saving, built-in remote control . . . compact AC design

Armor plate welding calls for low-hydrogen or stainless steel electrodes. P&H, pioneer in the low-hydrogen field, also offers the AC welder that gives you the best weldability with these rods — for greater production.

Your men like the P&H AC Dial-lectric — like its safety under the most adverse conditions; like the easy, quick-start arc, the elimination of arc-blow. And they get more done! Get sounder, better looking welds in less time, thanks to built-in remote control which lets them select the right heat at the work, turns *walking time* into *welding time.*

Because these welders give production such a lift, P&H has stepped up its delivery schedules to meet defense demands without delay. Get your production rolling in high gear. Order your P&H AC Welders today. Capacities up to 650 amps. Take advantage of this delivery situation while it lasts.

P&H **WELDING DIVISION**
4411 W. National • Milwaukee 14, Wis.
HARNISCHFEGER CORPORATION



GIVES YOU...

15 WAYS TO CUT THE COST OF BATTERY OPERATION!

The fifteen points listed below can greatly increase storage battery efficiency, dependability and service. Each one is thoroughly covered by the articles, manuals, bulletins, specifications, record cards, charts and graphs which comprise the GOULD PLUS-PERFORMANCE PLAN. That's why users of this Plan can improve their battery performance as much as 50%! With battery materials scarce—and getting scarcer—make your batteries last longer with the GOULD PLUS-PERFORMANCE PLAN. It's FREE to users of batteries of any make. Send for this booklet NOW!

HERE'S HOW TO CUT TRUCK BATTERY OPERATING COSTS

1. Be Sure Your Batteries Have Proper Capacity for the Job.
2. Give Your Battery Supervisor Complete Instructions.
3. Make Periodic Inspections.
4. Keep Accurate Records of Charging and Repairs.
5. Do Not Overdischarge Any Battery.
6. Give Boost Charge During Lull in Duty Cycle if necessary.
7. Give Equalizing Charges Periodically.
8. Set Charging Equipment Correctly.
9. Schedule Charging Operations to Avoid Down-Time.
10. Do Not Overcharge Batteries.
11. Locate Your Charging Stations Strategically.
12. Inspect All Charging Equipment and Meters Regularly.
13. Charge Idle Batteries Every Three Months.
14. Repair Batteries Promptly When Necessary.
15. Replace Batteries When They Deliver Less Than 80% of Rated Capacity.

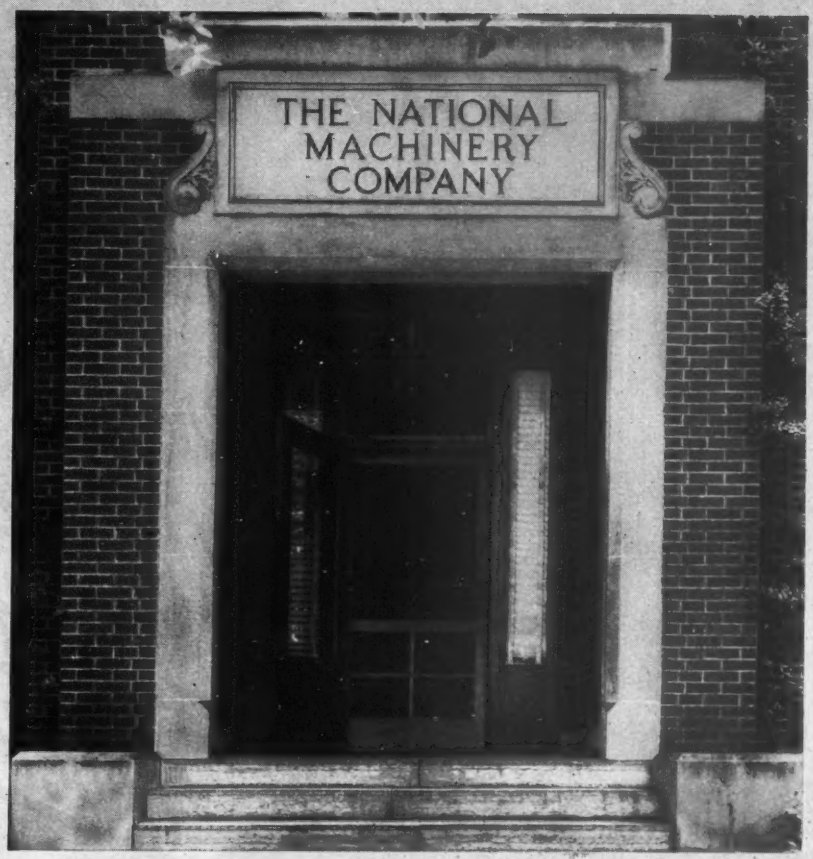
Gould "Thirty" with "Z" Plates
America's Finest
Industrial Truck Battery

GOULD

STORAGE BATTERIES

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, NEW JERSEY

Always Use Gould-National Automobile and Truck Batteries



This door is always open

The purchase of a new tool is not in itself assurance of greater profit. Equally important is its proper application to the job.

Our plant has become the forging laboratory, our engineering department the forging encyclopedia and our organization the forging consultants for industry.

Our leadership as pioneers of forging methods and applications establishes our ability to help you best.

When you come to NATIONAL, this service is yours.

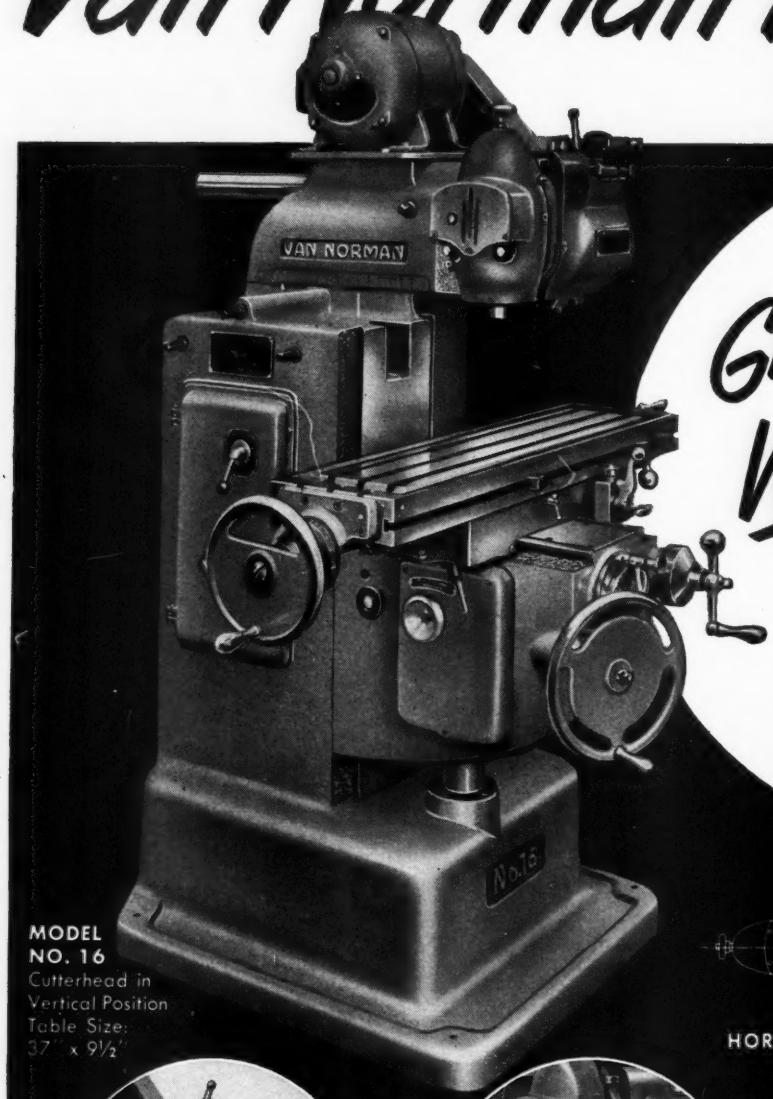
NATIONAL
MACHINERY COMPANY

TIFFIN, OHIO—SINCE 1874

DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS • BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS

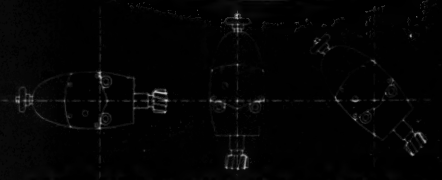
Hartford Detroit Chicago

Van Norman No. 16

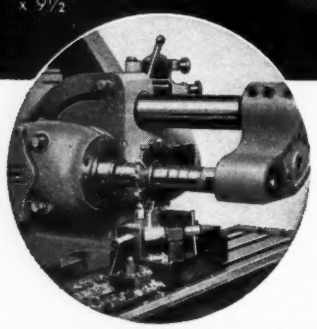


Gives You the Workability of Three Machines

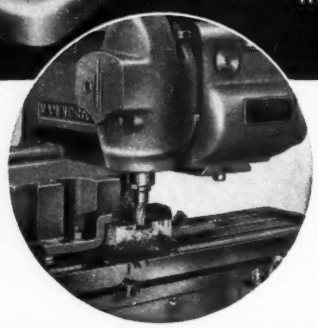
MODEL NO. 16
Cutterhead in Vertical Position
Table Size: 37" x 9½"



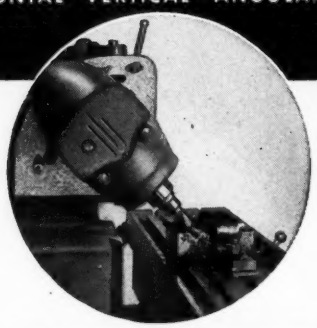
HORIZONTAL VERTICAL ANGULAR



With the cutterhead locked in horizontal position, the No. 16 is used for horizontal milling operation. Hardened stop set at factory assures positive 0° setting.



Illustrated, the No. 16 is used for a vertical milling operation. Permanently fixed hardened stop permits easy, accurate positioning of the cutterhead at 90°.



Here the adjustable cutterhead is set at 45° angular milling position. Horizontal, vertical, or angular milling all are easily performed on the No. 16 Miller.

Ram Type Miller

Here's a miller so versatile that it enables you to perform any and every milling job from horizontal to vertical . . . simply by positioning the adjustable cutterhead which is mounted on a movable ram. Why do you benefit . . . because with this one machine you have the work range of several single purpose millers. This enables you to keep the Van Norman miller working all the time . . . also many jobs can be carried through to completion without changes in the workpiece setup — saving time and reducing errors.

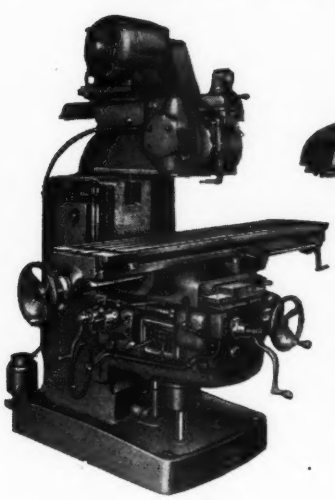
The Van Norman No. 16 Ram Type Miller gives you these additional advantages —

Conveniently grouped controls in front of knee makes operations easy. Power feeds are selected with a quick change feed selector. Large, easy-to-read dials.

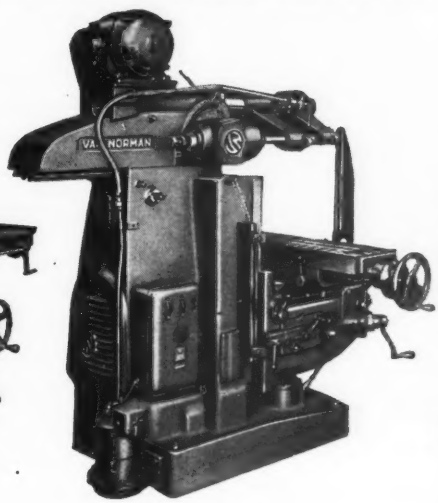
Built-in electric controls simplify operation. Single lever selector controls spindle, feed and coolant. Push-button, on front of knee, starts and stops motors as pre-selected.

Rugged base and column, massive cutterhead, large ram and heavy knee, saddle and table assembly provide maximum rigidity and long life accuracy.

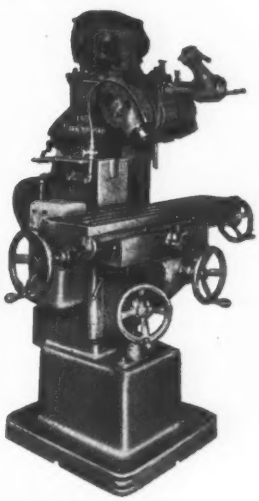
OTHER VAN NORMAN RAM TYPE MILLERS THAT REDUCE PRODUCTION COSTS



MODEL NO. 38
Cutterhead in Vertical Position
Table Size: 64" x 14"



MODEL NO. 22L
Cutterhead in Horizontal Position
Table Size: 45" x 10"



MODEL NO. 12
Cutterhead in Angular Position
Table Size: 37½" x 9 3/16"

VAN NORMAN COMPANY
SPRINGFIELD 7, MASSACHUSETTS

"Tycol Armitage boosts bearing life... smooths the way for faster, heavier loads"

Of course! Tycol Armitage Bearing Grease "stays put" ... keeps anti-friction bearings running smooth and cool. Its high stability makes it suitable for sealed anti-friction bearings that must last the life of the equipment.

Tycol Armitage possesses exceptional resistance to oxidation.

The dependable lubricating ability of this quality grease lengthens bearing life and cuts down maintenance costs.

Call your nearest Tide Water Associated office for further information.

SEND FOR A FREE COPY OF "TIDE WATER ASSOCIATED LUBRICANIA"

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INDUSTRIAL LUBRICANTS

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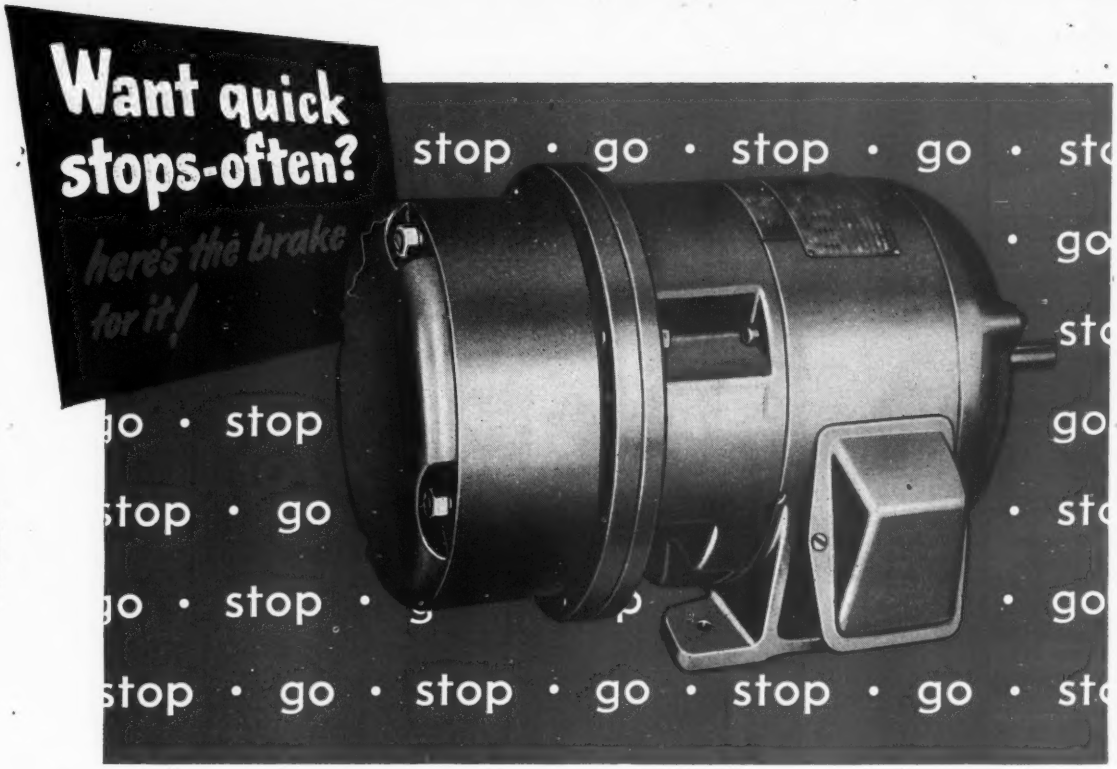
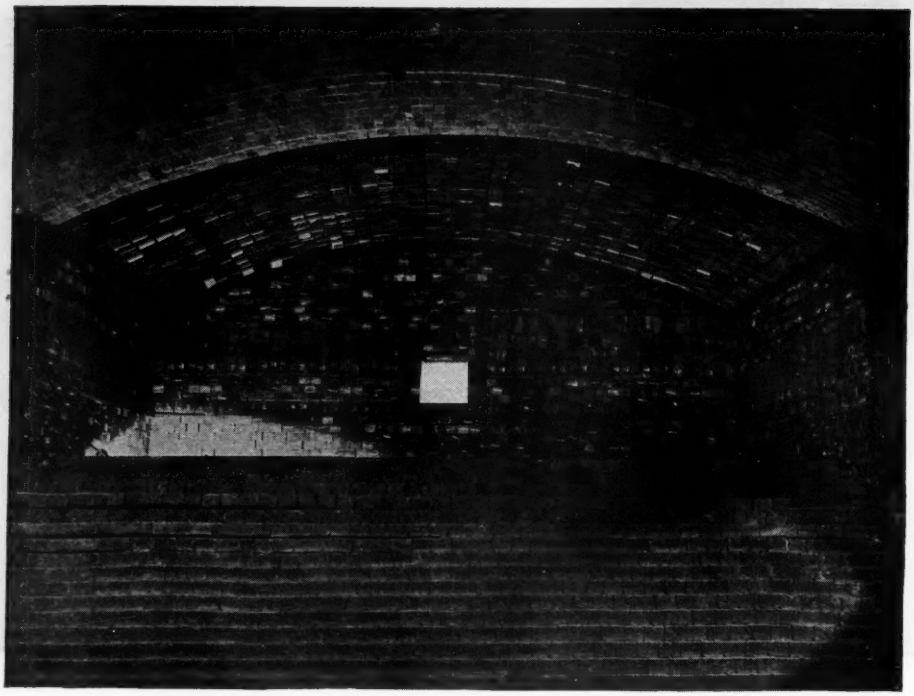
17 BATTERY PLACE - NEW YORK 4, N.Y.


Want quick stops-often?
here's the brake for it!
stop · go · stop · go · stop · go ·



Photograph Courtesy of Weirton Steel Company, Division of National Steel Corporation

● ● ● ● This is a suspended basic end in the world's largest open-hearth furnace. Such construction was pioneered by Grefco with its STEELKLAD basic brick. In the picture you'll find STEELKLAD in the end wall, the sidewalls and the port roof.

STEELKLAD is a patented, unburned basic brick, permanently jacketed in a steel shell, with the metal an integral part of the brick. A STEELKLAD wall rapidly becomes a tight, monolithic structure in service. It will deliver the longest possible life under the most severe conditions.

Nothing Could Be More Basic!

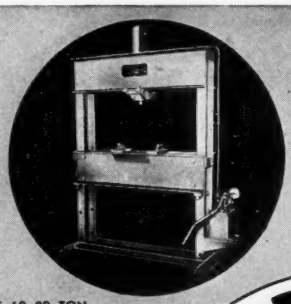
GENERAL REFRACTORIES

GENERAL REFRACTORIES COMPANY
PHILADELPHIA

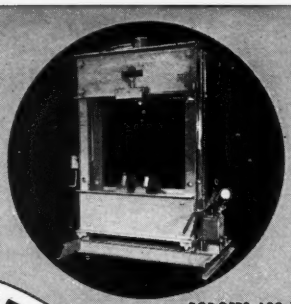
Grefco's STEELKLAD is resistant to spalling, has low thermal conductivity, high hot strength and great accuracy to specified dimensions.

With products like these, General Refractories is playing an important part in providing the steel industry with a complete refractories service. 43 mines, 29 plants, 18 sales offices, 200 distributing agencies—and the world's most modern research laboratories—are helping to meet industry's ever-growing demand for steel!

A Complete Refractories Service

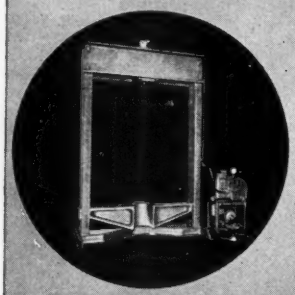


RODGERS 60–80 TON SHOP PRESS

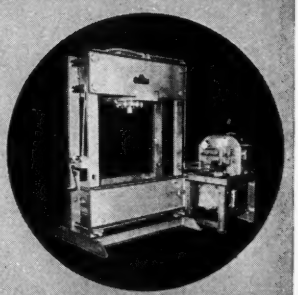


RODGERS 100 TON SHOP PRESS

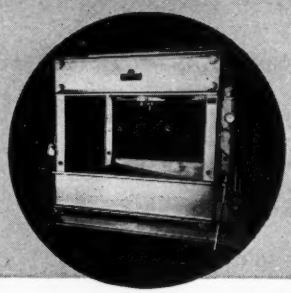
HYDRAULICS Rodgers KEEP THE WORLD MOVING



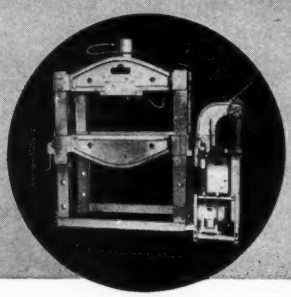
RODGERS SPECIAL SHOP PRESS



RODGERS 150–200 TON SHOP PRESS



RODGERS SPECIAL 100 TON SHOP PRESS



RODGERS 300 TON SHOP PRESS

FOR 101 UNUSUAL JOBS THERE'S NOTHING LIKE A

RODGERS SHOP PRESS

YES, a Rodgers Hydraulic Shop Press is about the handiest piece of equipment you can find for those many pressing, forming, bending and straightening jobs, for die tryout, short production runs and scores of other uses. They are versatile, time-and-labor-saving presses with construction and operating features that make them adaptable to all requirements . . . Standard model presses are available in 60, 80, 100, 150, 200, 300 and 400 ton capacities with hand or power pumps—special or modified units will be supplied to specifications.

Send for Catalog

Rodgers Catalog No. 313A has descriptions and specifications on the complete line of Shop Presses.

HYDRAULICS Rodgers

Rodgers Hydraulic, Inc.

7423 Walker St., St. Louis Park, Minneapolis 16, Minn.

HYDRAULIC POWER EQUIPMENT

Call for Republic's Pig Iron Metallurgist

He may not be an expert with a fly line, but the Republic Pig Iron Metallurgist can untangle in a hurry most of the problems which occasionally snarl up foundry operations.

He's a combination of trained metallurgist and practical foundryman—backed by years of actual foundry experience. When iron doesn't behave properly, he knows whether it's the fault of the mix or the way it's being handled. And he's not timid when it comes to giving you his frank and honest opinion —*in confidence.*

Hundreds of foundries — large and small —have found that it pays to call for the Republic Pig Iron Metallurgist whenever a tough problem slows down production. Why not do the same, next time trouble strikes your casting line?

Without cost or obligation in any way, Republic—*exclusive* producer of premium CHATEAUGAY Pig Iron—offers you the services of the Republic Pig Iron Metallurgist. Write, wire or phone whenever you want his assistance.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Dept.: Chrysler Building, New York 17, New York

Republic PIG IRON

"CHATEAUGAY" Low-Phosphorus, Copper-Free

"REPUBLIC" (Northern) Foundry, Basic and Malleable

"PIONEER" (Southern) Foundry and Basic

REPUBLIC STEEL

Nothing Like a Slitter

FOR SPEEDING PRODUCTION SCHEDULES

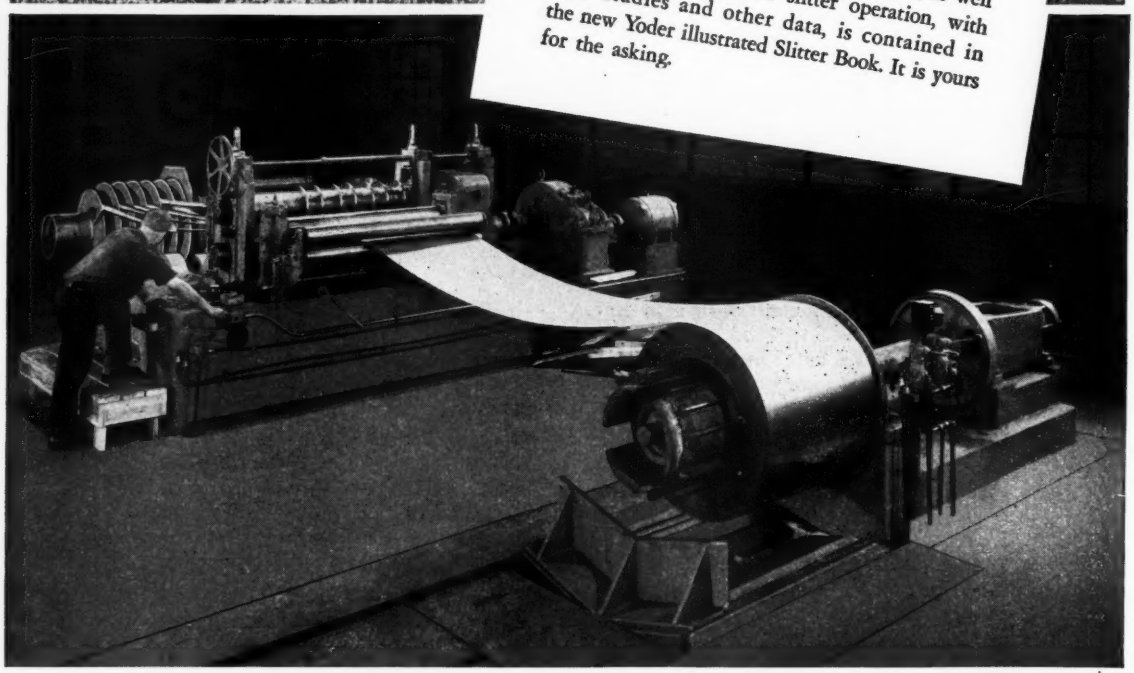
If you have a Yoder slitter you can buy mill-width coils instead of slit strands. Sources of supply of mill-width coils are more numerous, so you can buy wherever you like, at substantially lower prices, and obtain quicker deliveries.

Inventory requirements, too, are greatly reduced, because you can, in a few hours, meet expected and unexpected demands for slit strands with a relatively small stock of mill-width coils of the proper gauges.

This means better control not only of coiled strip supply, but of production planning; and production schedules are much easier to meet.

For requirements as low as 100 tons per month, direct savings alone may be sufficient to repay your investment in a Yoder slitter in the short time of a year.

Information on the respective merits of different types and sizes of slitters and accessories, as well as on the economics of slitter operation, with time studies and other data, is contained in the new Yoder illustrated Slitter Book. It is yours for the asking.

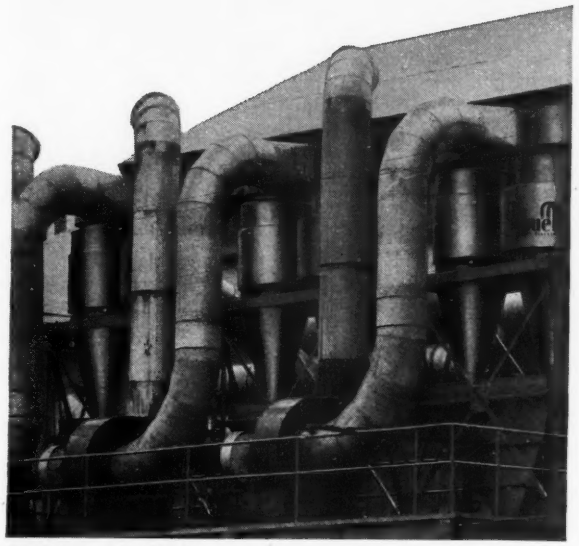


THE YODER COMPANY • 5502 Walworth Ave., Cleveland 2, Ohio

Complete Production Lines

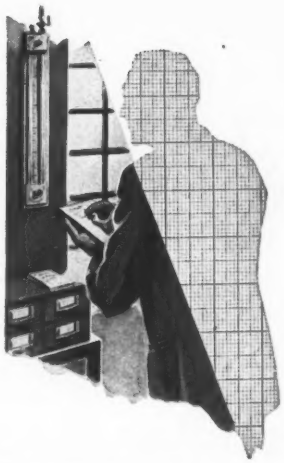
- ★ COLD-ROLL-FORMING and auxiliary machinery
- ★ GANG SLITTING LINES for Coils and Sheets
- ★ PIPE and TUBE MILLS—cold forming and welding

ENGINEERING YODER MANUFACTURING



Buell Cyclones installed in series to collect nuisance dust at a steel plant. High efficiency operation is assured by exclusive 'Shave-off' feature.

Worrying About Fly-Ash Discharge?



This industrial 'dust' man can help determine the Dust Abatement System most efficient for you!

The Buell organization of industrial 'dust' men is devoted solely to the design and construction of dust collection equipment that will most efficiently and economically solve your plant's specific Stack Dust problem.

For more than 18 years we have been doing just this for all American industry. Every Buell installation is a custom-designed system, engineered to hold stack dust discharge down to the practical limits which assure improved product and/or process, better plant-community relations, higher levels of employee morale.

For full information about Buell's ***3 basic systems*** of dust collection, and how one can be applied to the solution of your stack dust problems, write today. Ask for the new informative bulletin titled, "The Collection and Recovery of Industrial Dusts." Do it now. Buell Engineering Co., Dept. 26-C, 70 Pine Street, New York 5, N. Y.

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ELECTRIC CYCLONIC

HIGH EFFICIENCY CYCLONES • ELECTRIC PRECIPITATORS
TYPE 'LR' COLLECTORS • LOW DRAFT LOSS COLLECTORS
SPECIAL PURPOSE COLLECTORS • DUST HOPPER VALVES

ENGINEERED EFFICIENCY IN DUST COLLECTION

Lectromelt Furnaces — even the BIG babies — are completely assembled and mechanically operated here on our erection floor at Pittsburgh. This means they go together faster in your plant and you get into production without loss of time.

Lectromelt considers the power supply and regulating apparatus as important as the furnace itself. They'll even help engineer your materials-handling equipment. Both are additional reasons why Lectromelt Furnaces get going on production faster and at lower cost.

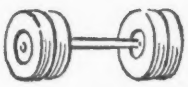
Melting, refining, smelting and reduction have been carried on for many years efficiently and economically with Lectromelt Furnaces. Our engineers will help put them to work for you. For Bulletin No. 7 telling you more about these furnaces, write Pittsburgh Lectromelt Furnace Corporation, 323 32nd Street, Pittsburgh 30, Pa.

Manufactured in . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2 . . . ENGLAND: Birlec, Ltd., Birmingham . . . SWEDEN: Birlec, Elektkougnar A/B, Stockholm . . . AUSTRALIA: Birlec, Ltd., Sydney . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa.

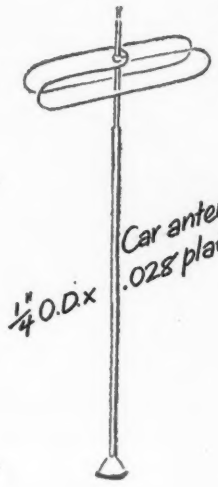
WHEN YOU MELT... MOORE RAPID *Lectromelt*

Bundyweld "Doodles"

to jog a designer's imagination

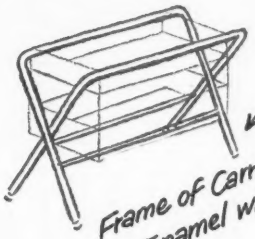


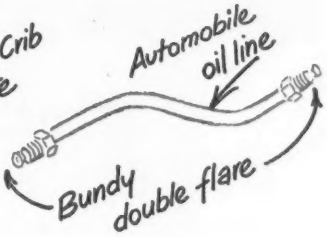
Toy truck axles



Redesigning to get better tubing function? Want smoother, easier fabrication? Need engineering help to crack tough tubing problems?

Then check into Bundyweld, the *only* tubing double-walled from a single strip, with inside and outside beveled edges. And check into the Bundy engineering services that have already helped hundreds of Bundy customers to save money, time, materials. Let us send you the information you need. ***Bundy Tubing Company, Detroit 14, Mich.***





Bundyweld® Tubing

DOUBLE-WALLED FROM A SINGLE STRIP

High thermal conductivity
High bursting point
Leakproof
High endurance limit
Extra-strong
Shock-resistant
Ductile

Lightweight
Machines easily
Takes plastic coating
Scale-free
Bright and clean
No inside bead
Uniform I.D., O.D.

WHY BUNDYWELD IS BETTER TUBING

Bundyweld starts as a single strip of copper-coated steel. Then it's . . .

continuously rolled twice around laterally into a tube of uniform thickness, and

passed through a furnace. Copper coating fuses with steel. Presto . . .

Bundyweld, double-walled and brazed through 360° of wall contact.

NOTE the exclusive patented Bundyweld beveled edges, which afford a smoother joint, absence of bead and less chance for any leakage.

Bundy Tubing Distributors and Representatives: *Cambridge, 42, Mass.:* Austin-Hastings Co., Inc., 226 Binney St. • ***Chattanooga 2, Tenn.:*** Peirson-Deakins Co., 823-824 Chattanooga Bank Bldg. • ***Chicago 32, Ill.:*** Lapham-Hickey Co., 3333 W. 47th Place • ***Elizabeth, New Jersey:*** A. B. Murray Co., Inc., Post Office Box 476 • ***Philadelphia 3, Penn.:*** Rutan & Co., 1717 Sansom St. • ***San Francisco 10, Calif.:*** Pacific Metals Co., Ltd., 3100 19th St. • ***Seattle 4, Wash.:*** Eagle Metals Co., 4755 First Ave. South ***Toronto 5, Ontario, Canada:*** Alloy Metal Sales, Ltd., 881 Bay St. • **Bundyweld nickel and Monel tubing is sold by distributors of nickel and nickel alloys in principal cities.**

Supply and demand in a photo-finish?

Actual photograph of photo-finish at a leading race track

What's the steel picture today?

Our comparison isn't too far-fetched.

The steel picture today is a race between supply and demand. For months, demand has been away out front. There hasn't been enough steel to go around. Military requirements and government allocations have had to come first.

But it won't always be that way.

And against the day when supply and demand reach a better balance, we want you to remember this:

Wisconsin Steel is known for quality.

Wisconsin Steel is known for keeping its promises, on specifications and on delivery dates.

We hope you'll have these facts in mind when we are able to ask you for an order.

INTERNATIONAL HARVESTER

WISCONSIN STEEL COMPANY, affiliate of INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue, Chicago 1, Illinois

WISCONSIN STEEL

B·S **Productioneered**
for Toolroom Grinding

NO.10N CUTTER AND TOOL GRINDING MACHINE

WITH UNIVERSAL OR PLAIN EQUIPMENT

Simplicity, flexibility and enduring accuracy are engineered into this machine . . . it is "Productioneered" to keep machines in your shop producing fast and smoothly. Roller-bearing table and simple, convenient controls are typical of many easy-handling features.

The No. 10N with Universal Equipment (illustrated) performs complete cutter and tool sharpening, plus light cylindrical, internal and surface grinding. With Plain Equipment, cutter and tool sharpening only.

Other useful Brown & Sharpe "Productioneered" Grinding Machines are shown on next page.

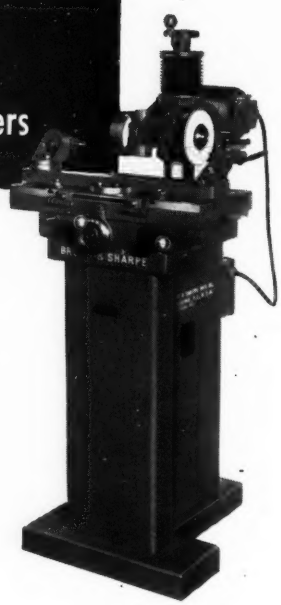
Brown & Sharpe

B·S Productioneered
for unusually broad utility

No.13 UNIVERSAL AND TOOL GRINDING MACHINE

Most versatile of the Brown & Sharpe grinding machines, this model is designed primarily for broad utility in the toolroom — but can also be speedily set up to care for limited over-flow of manufacturing work.

B·S Productioneered
for quick sharpening of tools and cutters



No.5 CUTTER AND TOOL GRINDING MACHINE

Especially designed for fast, efficient sharpening of cutters and tools — particularly smaller cutters and end mills. Additional equipment is available to further speedup sharpening in quantity.

Write for specifications of these machines or information on any other Brown & Sharpe product. Brown & Sharpe Mfg. Co., Providence 1, R.I., U.S.A.

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Milling Machines • Grinding Machines • Screw Machines • Cutters • Machine Tool Accessories
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STRETCH OUT YOUR STAINLESS, TOO

There *are* ways to stretch out your supply of stainless.

For example, you may be using a grade or finish of stainless that is in extreme demand when another similar one, not as tight, could do the job adequately.

Our metallurgical staff and stainless fabricating specialists are ready to help you look into this matter and to advise you on more readily-available types of stainless that will do a satisfactory job. Feel free to call on us for this specialized help.

CRUCIBLE first name in special purpose steels

52 years of Fine steelmaking

STAINLESS STEEL

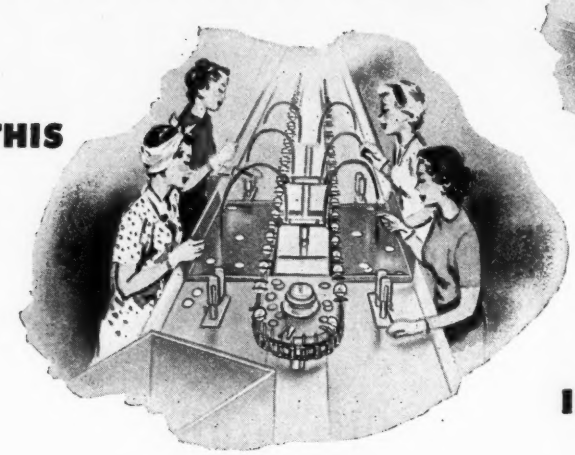
CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REZISTAL STAINLESS • REX HIGH SPEED • TOOL • ALLOY • MACHINERY • SPECIAL PURPOSE STEELS

..... NOT THIS

..... OR THIS

... BUT THIS



IS THE *Profit* WAY

The profit way is the modern materials handling way . . . economical chain conveyors. They assure a steady flow of materials along assembly lines and through the intermediate stages. Workers and equipment are not alternately "starved for" or "flooded with" materials. The costly waiting periods are eliminated. Faulty workmanship . . . costly rejects caused by overfast material flows are reduced.

This continuous material flow eliminates need for extensive storage around machines . . . frequently eliminates the need for the wide aisles required by other transporting systems.

The complete line of Chain Belt Company Conveyor Chains and Attachments provides an economical solution to the majority of handling problems. These efficient conveyors are essentially simple in design and operation . . . are suitable for any type of working condition. They are lightweight yet exceptionally sturdy . . . can be run in any direction . . . horizontally, vertically, up and down inclines and around curves.

The informative booklet, "Build Profits by Cutting Handling Costs," will give you a good picture of the possibilities of chain conveyors for your operations. Send for your copy. Chain Belt Company, 4660 West Greenfield Ave., Milwaukee 1, Wis.

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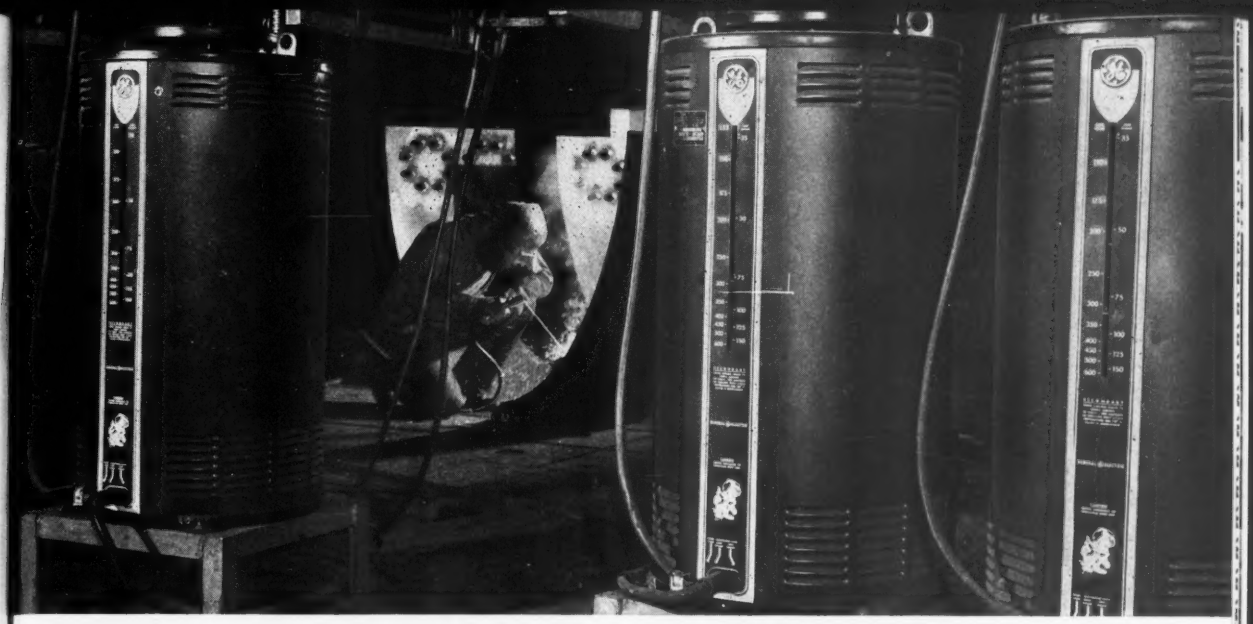
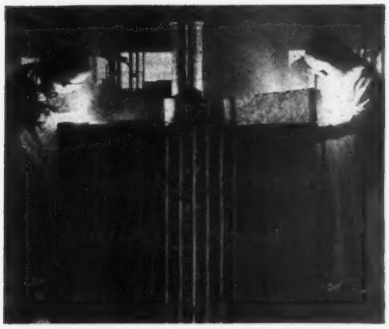
Distributors located in principal cities in the United States and abroad



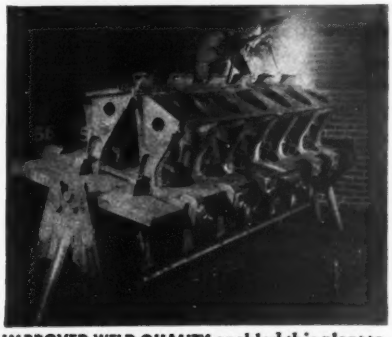
BEST FOR 3 OUT OF 4 WELDING JOBS!

WELDING SPEEDS INCREASED 20% after this company switched to AC. Deposition rates may be doubled because AC permits the use of higher currents and larger electrodes.



AC ELIMINATES TROUBLESOME ARC BLOW, permitting these welders to deposit ⅜ inch fillet up to 20% faster. AC is the ideal choice for deep fillet welding because the operator can easily control the arc.

AC CUT COSTS 10% and increased welding speeds 15% for this iron works. With AC, you save four ways—on labor, electrodes, power and original cost.



IMPROVED WELD QUALITY enabled this plant to meet rigid specifications on diesel engine crank cases and marine gear cases. The absence of arc blow makes it easy to deposit weld metal smoothly and uniformly, even in grooves and corners.

G-E AC Welders Increase Speed, Improve Weld Quality, Cut Costs, Eliminate Arc Blow

See Your G-E Arc Welding Distributor for complete information on G-E AC welders. They are available in 200- to 500-amp ratings for indoor or outdoor use. Most models are available on short delivery. Your distributor also carries a complete line of DC, engine-driven, Inert-Arc and Atomic-Hydrogen welders, plus electrodes and accessories. You can find your nearest distributor's name by looking for General Electric under "Welding Equipment" in the yellow pages of your telephone directory.

Section H 711-20, General Electric Company, Schenectady 5, N. Y.

Please send me immediately publications on the following G- AC welders.

× for immediate project
√ for reference

- ☐ 200-amp, GEC-553
- ☐ 300-amp, GEC-652
- ☐ 400-amp, GEC-750
- ☐ 500-amp, GEC-812
- ☐ 300-amp Indoor or Outdoor Model, GEC-779

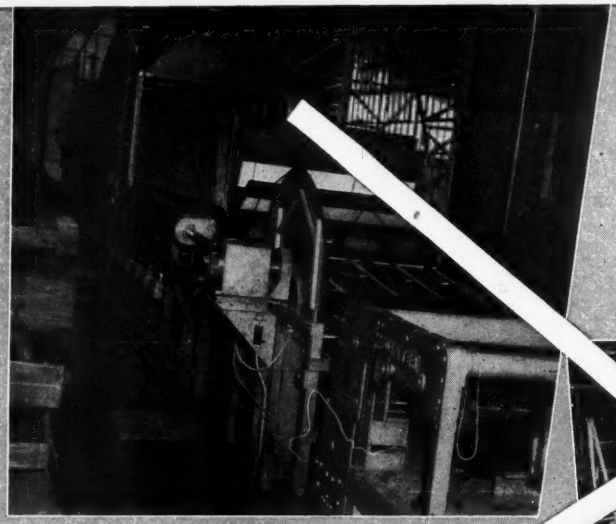
Name .....

Company .....

Address .....

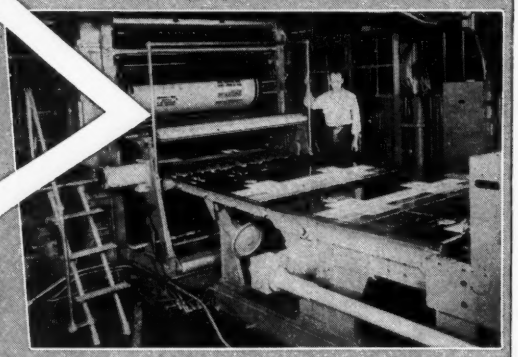
City ..... State .....

GENERAL ELECTRIC



Rheemcote Process Gas-fired oven at New Orleans plant pre-heats, bakes and cools sheet finishes at 4,200 per hr. rate.

Rheem Manufacturing Company's giant metal offset press lithographs 3′x6′ sheets of 18-gauge steel at a 4,200 per hr. rate.



color lithography on metal depends on GAS for processing at Rheem Manufacturing Company

Rheem Manufacturing Company's engineers worked with engineers of Wagner Litho Machinery Division to develop the GAS oven and related equipment necessary to lithograph and fabricate 55-gallon steel drums.

18-gauge steel sheets, 3′x6′ are fed into the giant offset press at a maximum speed of 4,200 per hr. After printing and coating, the sheets travel through a Gas-fired 210′ oven to be dried:

Pre-heat zone: 200°-275° F. for 6 min.
Baking zone: 175°-450° F. for 15 min.
Controlled cooling zone for 7 min.

After lithographing one side and lining the other, sheets are fabricated into steel drums. This Rheemcote Process permits users to identify their products in drums with familiar, colorful trade-marks. Liquid and solid materials and chemicals are shipped all over the world in these Brand-name drums.

The Rheemcote Process is an example of how GAS can be used to meet specialized problems in a production line. Gas is the ideal fuel to use, because Gas temperatures are readily controlled automatically, because Gas is clean, efficient, and economical. Whatever your requirements, learn how GAS can serve you. Call your Gas Company Representative today for the facts.

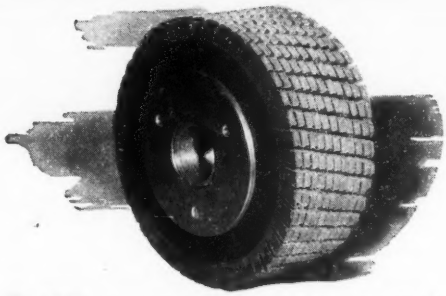
AMERICAN GAS ASSOCIATION
420 LEXINGTON AVENUE, NEW YORK 17, N.Y.

How would you solve it?

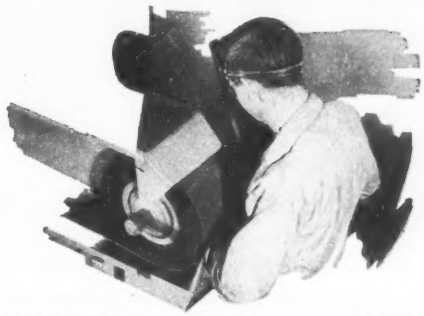
Production problem:

Break a "bottleneck" caused by standard weld-removal methods on cold-rolled steel stator shells

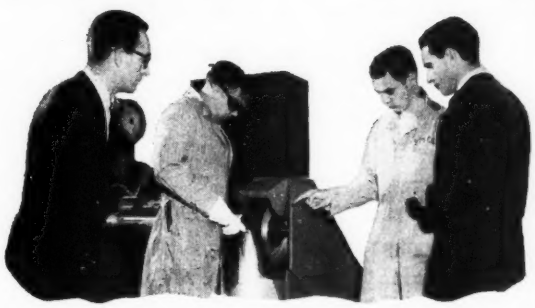
1 Here's what Century Electric Company, Saint Louis, Missouri, did. They turned their weld-removal problem over to a 3M Methods Engineer, who studied the problem with Century Electric specialists and came up with a solution.



2 3M's recommendation was a conversion to backstand equipment with fast-cutting abrasive belts. A specially engineered contact wheel was recommended—plus the right abrasive belt, grit size, and operating speed.



3 Now Century Electric uses the 3M Method to finish stator shells 800% faster than with the previous equipment. Production has jumped from 15 to 125 pieces per hour with smoother finishes too!

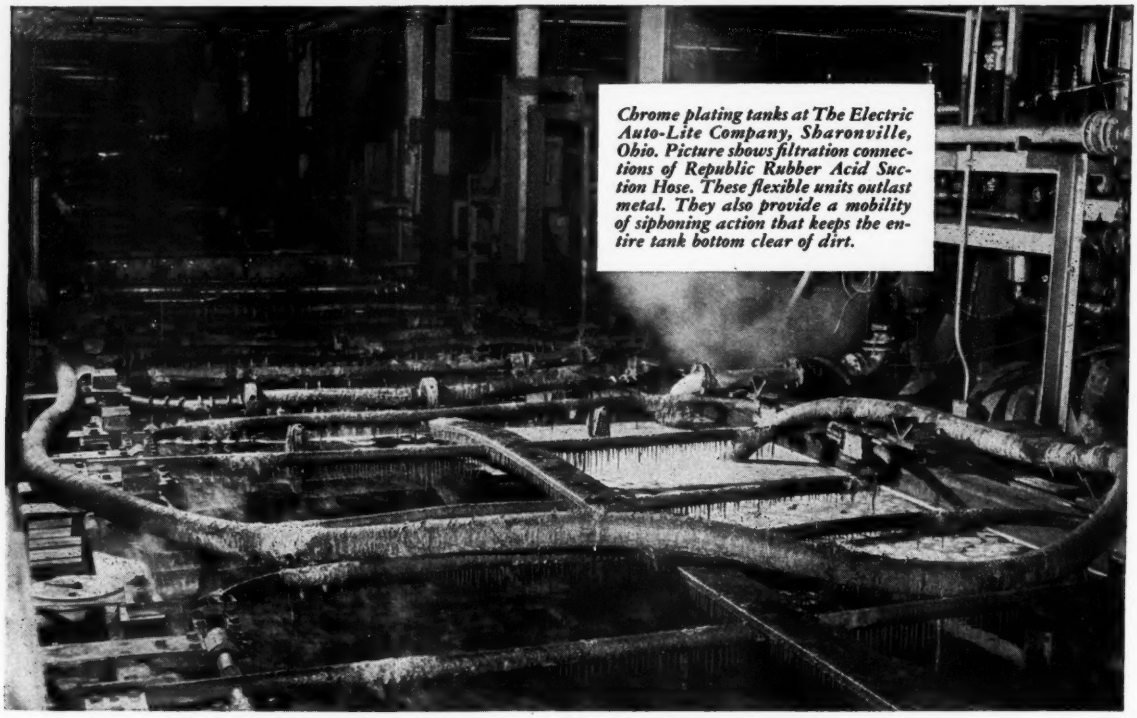


4 3M maintains Demonstration Rooms in principal cities throughout the country, where abrasive engineers will demonstrate how you can cut *your* grinding and finishing costs. For additional information on the 3M Method, write for a copy of the "Step UP Production" booklet, Dept. ST 32, Minnesota Mining and Manufacturing Co., St. Paul 6, Minnesota.

3M ABRASIVE BELTS

See 3M Company's TV Program "JUVENILE JURY" on NBC Network

Made in U.S.A. by **MINNESOTA MINING & MFG. CO.**, St. Paul 6, Minn. — also makers of "Scotch" Brand Pressure-sensitive Tapes, "Scotch" Sound Recording Tape, "Underseal" Rubberized Coating, "Scotchlite" Reflective Sheeting, "Safety-Walk" Non-slip Surfacing, "3M" Adhesives. General Export: Minn. Mining & Mfg. Co., International Division, 270 Park Avenue, New York 17, N. Y. In Canada: Minnesota Mining & Mfg. of Canada, Ltd., London, Canada.



Chrome plating tanks at The Electric Auto-Lite Company, Sharonville, Ohio. Picture shows filtration connections of Republic Rubber Acid Suction Hose. These flexible units outlast metal. They also provide a mobility of siphoning action that keeps the entire tank bottom clear of dirt.

Case history of—HANDLING ACID THROUGH RUBBER HOSE

Getting a flexible carrier that could handle chrome plating solution was the problem facing The Electric Auto-Lite Company at their Sharonville, Ohio plant.

The solution, in addition to being highly acid, is saturated with ionized particles of nickel. Ordinary rubber hose had a tendency to pick up these particles. What's more, the acid eventually penetrated to inner hose reinforcements, which were destroyed.

Carriers of metal pipe were no better. In the first place, they weren't flexible. The acid slowly dissolved the pipe wall, leaving a dangerously thin shell that could give out any time without warning.

What was the answer? Well, Auto-Lite called in their local Republic Rubber Distributor, an expert in Industrial Rubber applications, who recommended use of Republic Acid Suction Hose.

This flexible carrier is specially built to withstand action of either acids or alkalies. It's made with rugged abrasion-resistant cover, a sealed-in, metal-reinforced carcass and a tube that can handle caustic liquids at temperatures up to 150°F.

The Electric Auto-Lite Company is highly pleased with the performance of this Republic Rubber Hose. They like the quick, sure way Republic Distributors diagnose, then solve difficult problems in the application of Industrial Rubber Products.

We suggest that you may also enjoy doing business with a company that for 52 years has specialized both in building better rubber products and giving you better service at the local level.

Write today for special product information and the name of your nearby Republic Distributor.

INDUSTRIAL RUBBER PRODUCTS BY
REPUBLIC RUBBER DIVISION
Lee Rubber & Tire Corporation
YOUNGSTOWN, OHIO

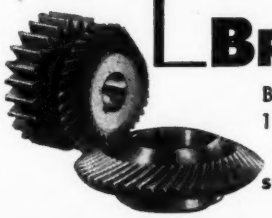
Announcement

Brad Foote Gear Works, Inc.,
1309 South Cicero Ave. Cicero 50, Illinois
has purchased and will operate
as its subsidiary the

PITTSBURGH GEAR COMPANY | 27th & Smallman Streets PITTSBURGH 22, PA.

- For more than thirty years, the **PITTSBURGH GEAR COMPANY** has designed and manufactured gears chiefly for the mining and steel industries. It has been relied upon for two well-known products: "Armored" Gears and Crane Track Wheels.
- The Pittsburgh Armoring Process is a unique development, guaranteed to give gears and wheels five times the life of untreated, and one-and-one-half times the life of oil-treated gears and wheels.
- As a wholly-owned subsidiary of **BRAD FOOTE GEAR WORKS, INC.**, **PITTSBURGH GEAR** will continue, and expand, its operations as a principal supplier of all types of gears and crane wheels for steel mills, mines, and industry in general. A stock of gears and parts for mine loaders, cutters, and locomotives will be maintained.
- The full research and development facilities of **BRAD FOOTE GEAR WORKS**, and its other subsidiary, **AMERICAN GEAR & MFG. CO.**, will become a part of the over-all service offered by **PITTSBURGH GEAR**. Thus a well-established gear manufacturer is strengthened by its affiliation with one of America's leaders in the gear engineering and manufacturing field.
- Your inquiries are invited.

Truman L. Anderson



BRAD FOOTE GEAR WORKS, INC.

Bishop 2-1070 • OLympic 2-7700
1309 South Cicero Avenue • Cicero 50, Illinois

subsidiaries | **AMERICAN GEAR & MFG. CO.** • **PITTSBURGH GEAR COMPANY**
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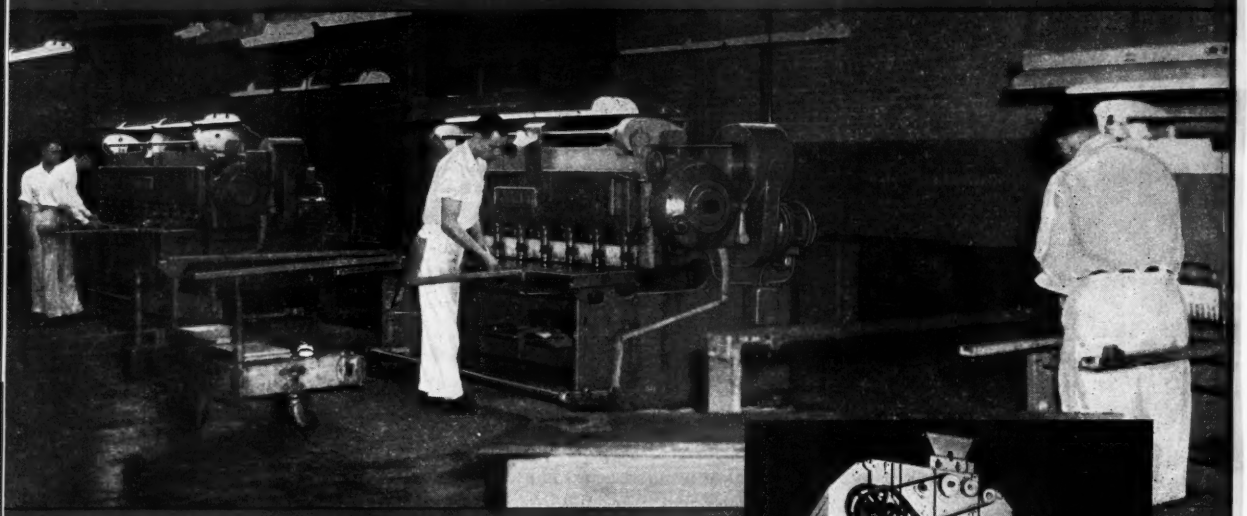
3 CINCINNATIS

...shear 750,000 lbs. of steel every 22 days



THIS productive and dependable battery of Cincinnati Shears at the John E. Mitchell Company is shearing with accuracy in the manufacture of extracting, cleaning and drying equipment.

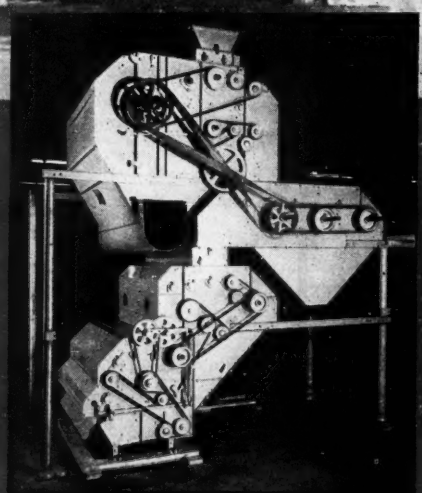
Freedom from shut downs, long knife wear, officient, accurate gauging and general ease of control all contribute to this steady production.

C-1010 steel in 20, 16, 12 and 7 gauges is being handled.

A 6-foot, 8-foot and a 10-foot Cincinnati Shear make up the battery.

Cincinnati All-Steel Shears are economical producers, and their accuracy also reduces assembly costs.

Write for latest Shear Catalog—S-6—on the complete line of Cincinnati All-Steel Shears.



A John E. Mitchell Company combination machine used in cotton gins. Photos courtesy of the John E. Mitchell Company.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

March 17, 1952

Buck-Passing in the Steel Case

OPS is passing the buck in the steel wage case (p. 55). It says it hasn't the authority to grant price increases except about $3 a ton under the Capehart rulings. But WSB, a parallel agency, does feel it has the power to approve a whopping steel wage hike—around 20 cents an hour. What it all amounts to is this: The steel union can win its demands because of government intervention. The companies can't get compensating price increases because of government interference. The snafued situation means that the odds today are 3 to 2 in favor of a strike.

Hit-and-Run Rail Strikes?

More hit-and-run railroad strikes are likely. The midwestern tie-up of the New York Central lines last week was a test case. That type of walkout may evolve into a series of running strikes, a new weapon for the railroad brotherhoods who are trying to force a decision in a long, complicated dispute. Business losses from last week's affair generally were not serious, but they were irritating.

Mr. Lewis Is Quiet

Another labor trouble spot is coal. Mr. Lewis' cohorts are free to strike any time after Mar. 31, but thus far the United Mine Worker boss has been surprisingly quiet. One reason may be publicity. He knows that the steel workers will have the limelight for the next week or two at least. Another reason is coal stocks. As of Feb. 1, 1952, supplies at coke ovens were 13.8 million tons, a comfortable margin even though it fell 9.5 per cent from the previous month. Steel mill stocks, at 1.2 million tons, were up 2.7 per cent from the preceding month.

Redesign Job for the Military

Department of Defense has about completed a major redesign job on hundreds of hard goods that is expected to save 10.6 million pounds of copper, 598,000 pounds of zinc and 602,000 pounds of nickel. It has saved more than 5 million pounds of copper, alone, by substituting steel for the red metal in small arms ammunition. Artillery ammunition cartridges are now made of steel instead of brass, with the exception of the 120 mm size.

Shift in Tools and Dies

The tool and die shortage is easing, but spottily. Shops are still heavily booked in many districts, but for the first time in more than a year, many leading tool and die plants in the New York metropolitan region are able to accept larger quantities of future orders. Some major defense tooling has been completed, leaving a vacuum.

OPS Gets Tough

OPS is cracking down heavily in its stepped-up enforcement program. In the week ended Mar. 8, 83 injunctive and treble damage actions

Production-Engineering News—p. 83 *The Market Outlook—p. 143*

were filed throughout the country. The treble damage figure amounted to more than $1 million. In addition, 42 firms paid the government $38,858 in restitution for overcharges where no wilfull violation was charged. Most of the cases are against dealers and brokers, many handling metalworking products.

IMC Under Attack

The International Materials Conference, the super group that has a lot to say about world distribution of nonferrous metals and other materials, is under attack. Republican congressmen are calling it a "super cartel." They say it has too much power to influence the American economy. The U.S. is just another member of IMC although it's the world's largest consumer of practically every material. The GOP is considering a congressional battle to force a change in America's IMC participation.

Electric Farms: Boon to Business

A silent revolution is going on in farming that may pay big dividends to metalworking over the next decade. It's the rapid rural electrification that will mean new markets for electric farm machinery. Last year more than 26 million planted acres were lost, or abandoned, because of drought or flood. That was the biggest acreage loss since the drought of 1936, but farmers' total output was close to the all-time high. Electrification helped do that. Even greater electrification strides are coming.

Straws in the Wind

Fisher Body is negotiating for a heavy press subcontract to fill the gap left by the Bullard cancellation . . . Minneapolis-Honeywell wants to edge into the Sonar field . . . Commerce Secretary Sawyer last week honored with Certificates of Service 188 business and industry men who have served the government without compensation during mobilization . . . Small businesses got 25 per cent of the Navy's procurement dollar in January . . . NPA is considering approval of all applications on hand for new commercial construction in seven employment hardship areas . . . Legislation pending in Congress, if passed, would allow government agencies to decide the validity of patents, says a spokesman for the aircraft industry . . . Chicago Pneumatic Tool Co. will build a $4.5 million plant in Ft. Worth, Tex., to make oil well drilling equipment.

What Industry Is Doing

Forge shop outlook brightens, but more large, quality bars are needed (p. 56) . . . Premium prices deter consumers from buying extra steel allotted (p. 57) . . . A good business gage—gray iron castings production—shows signs of rallying (p. 58) . . . $200 million is being spent on development of Western metal resources (p. 59) . . . Lake ore season opening nears; the goal is 96 million tons (p. 66).

This is another of the "HUNDREDS OF JOBS" which can be done on a MARVEL Band Saw!

MARVEL BAND SAW saved these two 4400 lb. castings

Two sand cores washed out when these giant 4400 pound steel connectng rods were cast, resulting in solid eye ends without gaps. Then came the $64 question—how to machine out the 1½" slots in the longitudinal center of the eyes which were 22" high and had a wall thickness of 6½".

The Ernest J. Nelson Iron Works of San Francisco, did this "impossible" job easily, quickly, and economically, without special tooling, on a standard Model #8M/2 MARVEL Band Saw. Two cuts were made in each rod in two hours per cut with tool cost of $3.06 per rod. The tool was a MARVEL B9-10 Band Saw Blade.

Every tool room, machine shop and maintenance department needs a MARVEL Series 8 Universal Band Saw—not only for innumerable everyday jobs but for the occasional "trick" operations, where its utmost versatility will save many headaches and dollars.

WRITE FOR CATALOG

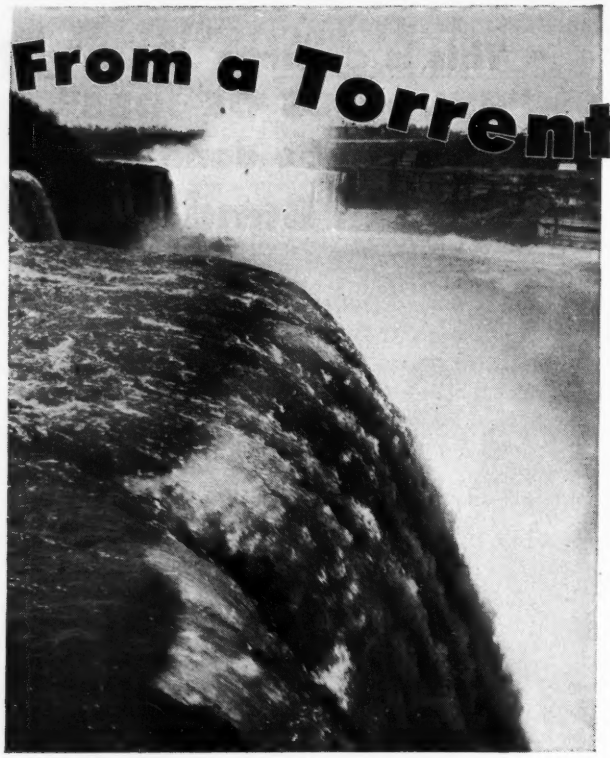
MARVEL Metal Cutting SAWS
Better Machines-Better Blades

These exclusive MARVEL Features made this job easy.

1. Large, T-slotted work table.
2. Blade feeds into work vertically; work always stationary.
3. Power-pressure feed.
4. Automatic Blade tension.
5. Built-in coolant system.
6. Large capacity.

ARMSTRONG-BLUM MFG. CO.

5700 BLOOMINGDALE AVENUE **CHICAGO 39, ILLINOIS**



From a Torrent to a Trickle

. . . In Less Than 30 Days!

That's what can happen to what has been full capacity steel production . . . unless open hearth scrap piles are built up . . . and at an accelerated rate . . . STARTING NOW.

That's how low scrap inventories have dwindled.

So take another look at YOUR dormant scrap and TURN IT IN.

ONLY NON-STOP SCRAP COLLECTION can insure NON-STOP STEEL PRODUCTION this year.

DEPENDABLE DAN
T.M. REG. U.S. PAT. OFF.

Sure, Dependable Dan is head-over-heels in the scrap emergency drive for its duration. Obviously, "No Scrap-ee—No Steel-ee!"

But he's still very much on the job delivering Job-Fitted Sheet and Strip Steel, as you can see.

Can he be of any help to you?

In cooperation with the Steel Industry Scrap Mobilization Committee

DETROIT STEEL CORPORATION

PRODUCERS OF
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COLD ROLLED STRIP STEEL and FLAT WIRE

Coils . . . Cut Lengths . . . All Tempers

SHEETS

COLD ROLLED . . . HOT ROLLED . . . H. R. PICKLED . . . LONG TERNE . . . GALVANIZED

Standard and Production Sizes or Cut to Actual Working Dimensions

Rotten Apples

Last week a young man in the early stages of building a career and raising a family was heard to remark: "I wouldn't mind paying high income taxes if I thought my money was being spent sensibly. It gripes me to know that so much of it goes down the sewer."

This lament was uttered the day before a book on corruption in government appeared in the nation's bookstores. This volume, by Blair Bolles, is entitled "How To Get Rich in Washington" or the "Rich Man's Division of the Welfare State." The publisher is W. W. Norton & Co. Inc., New York.

We recommend that industrial executives read this book. It will not be pleasant reading. At times one will want to place a clothespin over his nostrils to shut out the stench. There may be minor inaccuracies and some improper inferences but in the main the text is a factual report of recorded testimony. It recites chapter and verse of a deterioration in ethics that is beyond belief.

Most emphasis on corruption in Washington has been focused upon government employees, yet everybody knows that it takes two parties to make a deal. Author Bolles takes pains to name not only the public servant who has profited from a shady deal, but also the individuals or corporations whose initial requests for favors led to corrupt practices. We think industrial executives should study every corporate or individual name in the book and then decide for themselves which of them are guilty.

Mere mention of corporation or individual in the book does not imply wrongdoing. In every case, one's judgment will be governed by the circumstances attending the incident in question. Nevertheless, when an honest industrialist has read this book from cover to cover, he will feel extremely uncomfortable. He cannot escape the realization that the comparatively few rotten apples in industry's barrel have a tremendous potential for damage.

As for the young man and his income tax, think how much more perturbed he would have been had he read "How To Get Rich in Washington" before he filed his return!

E. C. Shaner

EDITOR-IN-CHIEF

DOES HAIR SHIRT FIT? If, after reading "How To Get Rich in Washington," you want to get into something that strikes very close to home, pick up the March issue of "Atlantic Monthly" and read "Free Enterprise Is Not a Hunting License." Here you are not reading the account of a journalist; you are digesting the considered opinion of Clarence B. Randall, president of Inland Steel Co.

Mr. Randall uses homely incidents to put over

his point. Visiting a friend living in a remote Chicago suburb, he asked "What do you do around here when the house catches fire?" His host replied calmly: "We know exactly what to do. We get on the telephone immediately. All the neighbors rush over and watch the house burn." The implication is that businessmen are fiddling futilely while, like Rome, our cherished institutions are being consumed in the fires of socialism.

Again resorting to homely illustration, Mr. Randall cites the qualities of leadership in a blacksmith in his native small town in New York. This smith was religious, civic-minded, politically-minded and alert to social problems. Who among us today, asks Mr. Randall, takes the leading role in these activities that our forefathers did?

Read "Free Enterprise Is Not a Hunting License" and you may become painfully aware of the fact that industrial executives of our generation have some things to learn from their predecessors. Does this hair shirt fit?

* * *

WASHINGTON HALITOSIS: When the National Labor Relations (Wagner) Act was enacted on July 5, 1935, its advocates hailed it ecstatically as the workingman's Magna Charta. It was envisioned as a law that would permit employees to bargain collectively through representatives of their own choosing. In the rarified atmosphere of lofty idealism of that period, nobody thought for a moment that bargaining for wages and working conditions ever would sink to present depths. Today's haggling over steel wages is not collective bargaining. It is a thimble-rigged farce in which sordid political considerations have taken the place of fairness and justice. Washington bureaucratic halitosis has infected labor relations. That is why nerves of negotiators are taut, tempers are rising, bitterness is rampant and the danger of a strike is mounting.

* * *

INDEPENDENT VOTERS: It remains for the political experts to explain the significance of the vote in the New Hampshire primary. Nevertheless, mere laymen cannot overlook the fact that in the several industrial centers of the state, where union labor leaders pledged 100 per cent support for President Truman, Senator Kefauver, with his coonskin cap and French-speaking attractive wife, received a substantial margin of the Democratic votes.

Sometimes we wonder how long it will take to convince top union brass that, politically, union members are independent individuals who will vote according to their own convictions.

* * *

GAINS IN OIL AND GAS: A year ago oil and gas men were saying that shortages of steel and equipment would seriously curtail the drilling of new wells which in turn would impair urgently needed exploratory work. A joint report issued by American Petroleum Institute and American Gas Association shows that the oil and gas people not only fared pretty well but they actually broke all records in 1951.

An estimated 44,500 wells were drilled, of which 26,500 produced oil or gas or both. More important is the fact that by virtue of these new wells, plus improvement of existing oil and gas fields, the proved reserves of liquid petroleum and natural gas reached new alltime peaks as of Dec. 31, 1951. Reserves of liquid petroleum increased 2.7 billion barrels during the year, in spite of record-breaking production. This is the largest annual increase in reserves on record. The net increase in reserves of natural gas in 1951 was 8.2 trillion cubic feet, the second highest annual gain in history.

* * *

SEE EARLY ORE START: Shipments of automobiles by vessel across Lake Erie last week marked the opening of the 1952 navigation season. This annual event is a reminder that the big iron ore fleet will be in action within a few weeks. At present, ice conditions in the North indicate that the start of ore carrying in 1952 may be as early as Apr. 6, which was the opening date in 1951.

An unofficial goal of 96 million tons has been mentioned for the approaching navigation season. This will tax the capacity of the enlarged fleet. In fact, lake vessel men think that if they bring down anything above 90 million tons they will be doing a remarkable job. The weather may be the deciding factor.

RYERSON
Up-to-the-Minute Steel Service
. . . 110 Years Young
PRINCIPAL PRODUCTS
CARBON STEEL BARS—Hot rolled and cold finished
STRUCTURALS—Channels, angles, beams, etc.
PLATES—Many types: Inland 4-Way Safety Plate, etc.
SHEETS—Hot and cold rolled, many types and coatings
TUBING—Seamless and welded, mechanical and boiler tubes
ALLOYS—Hot rolled, cold finished, heat-treated . . . Standard and aircraft quality
STAINLESS—Bars, plates, sheets, tubes, etc.
REINFORCING—Bars and accessories, spirals, wire mesh
BABBITT—Five types, also Ryertex plastic bearings
MACHINERY & TOOLS—For every kind of metal fabrication
JOSEPH T. RYERSON & SON, INC.
RYERSON STEEL
RYERSON STEEL
110 YEARS OF SERVICE
1842-1952
RYERSON STEEL SERVICE PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

Do you Recognize the Steel Parts Pictured Below?

They represent 9 reasons why you may still have trouble getting Inland Steel

In spite of Inland's record-shattering production year (12 all-time records were broken in 1951), Uncle Sam allocated much of the steel you needed to the Armed Services.

That's why Inland is adding capacity to give you the steel you need.

1. Section of aircraft landing mat
2. Ration cans
3. Frame for army cot
4. Aviation gas truck tank
5. 105 mm. howitzer gun tube
6. Barbed wire entanglement post
7. 5 gallon "Blitz" can for gas or water
8. Forging for 105 mm. shell
9. Fin assembly for 500 lb. cluster bomb

INLAND

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Steel Strike Odds: 3 to 2

If we have a strike, we'll have new steel shortages. And that means a continuation of strong government controls, probably for a year or more

ODDS now are 3 to 2 we'll have a steel strike. And the odds are going up.

In mid-January few steel men thought there was more than an outside chance for an industry-wide work stoppage. By mid-February the situation had deteriorated and some in industry conceded a strike was possible but the betting still favored a peaceful settlement. By mid-March the situation has become so grave that many men are predicting we soon will have the third major postwar walkout.

Treading Water — If a strike comes it will mean that steel supplies, noticeably improving for the past two months, will again become tight. A strike would cost production 2 million tons of ingots weekly. All but a handful of producing mills would be closed down.

Controls over materials, now being eased or in prospect of being eased, would return in full force and would continue in effect for a longer period.

Crucial—From now until midnight, Mar. 23, when the truce ends, one major and two subsidiary factors can turn the scales.

The major factor is steel prices, not steel wages. The government's Wage Stabilization Board by some hocus pocus finds that the union is legally entitled to a wage increase package in the neighborhood of 20 cents an hour. The union will accept this finding gladly.

Washington then says that the steel producers are entitled to a price increase of about $3 a ton under the Capehart amendment, which takes into consideration increases in costs up to last July. It makes no provision for a price increase to compensate for the wage increase which it now proposes. Steel producers figure the package wage increase proposed will up costs by $8 to $9 a ton. In all fairness, they contend, they should get a price increase of $11 to $12 a ton.

NEA

NEW SHORTAGES BREWING. . . . *less steel, more controls*

Compromise — The steelmakers don't expect to get $12 a ton. But they won't settle for $3 and grant the wage increases proposed. Likely ultimate solution is a compromise somewhere between those two figures.

It All Depends—Whether the settlement is reached before or after a strike depends on two subsidiary factors: The degree to which ill feeling among labor, government and management has developed and the degree to which the parties involved, notably government, will allow self interests to dictate the decision.

Ill feeling in the wage case has grown alarmingly. The arguments before the special WSB panel worsened the relations between management and labor and the government's behind-the-scenes dickering on the matter since the hearings ended has angered industry. Inland Steel Co. President Clarence B. Randall says, "It would be an irresponsible act for any governmental authority to throw the destructive inflation mechanism back in gear" by granting a large pay hike that necessitates a price rise.

Jones & Laughlin Corp. Chairman Ben Moreell calls the U. S. manipulations "unfair and a breach of good faith."

Rigging — Watch carefully the government's manipulations to throw the onus for a strike, if one comes, on the steel industry. First, WSB will report that the workers are entitled to a substantial wage increase. Then the Office of Price Stabilization will report on how much prices may be increased under the Capehart amendment. There is no connection between the two and the modest price increase allowed under Capehart in no way compensates for the wage increase. But that fact will be obscured in the excitement. Then OPS will disclaim any authority to grant further price relief, will point out that such relief must come from the White House.

Some industry people suspect the administration is less keen to prevent a steel strike now than it was last fall. Government officials well know that a strike will cause a new steel shortage fast. That will mean controls must be kept or even tightened.

Preparedness—More than usual preparations for a strike appear in the making by both union and the steel companies. Such precautions always are taken in situations as that now existing, but seldom have they been so elaborate or public.

Slippage—An estimated 18 million tons of ingots have been lost due to strikes since World War II ended, the bulk in the big walkouts of 1946 and 1949. If we had that 18 million tons, would there have ever been a postwar steel shortage? That question is academic today, but there's no question that we'll have a shortage now if the steelworkers go out.

A five-week stoppage and the resulting loss of 10 million tons of ingots would give us a bad short-

age—and strong controls—for the rest of the year at least.

Aluminum Wage Ruling Pends

"Status quo" characterized the aluminum wage situation last week as testimony continued before a Wage Stabilization Board panel. Testimony by spokesmen for the industry and the United Steelworkers of America—CIO was completed and AFL representatives were testifying. Workers of the United Automobile Workers and the International Mine, Mill & Smelter Workers unions were watching and waiting.

Etchers Ask for More Materials

In order to fill its rated orders, the Etched Products Industry Advisory Committee asked the National Production Authority to grant the industry additional controlled materials.

Ninety to 95 per cent of its orders are rated, the committee reports, but few of them are military ratings.

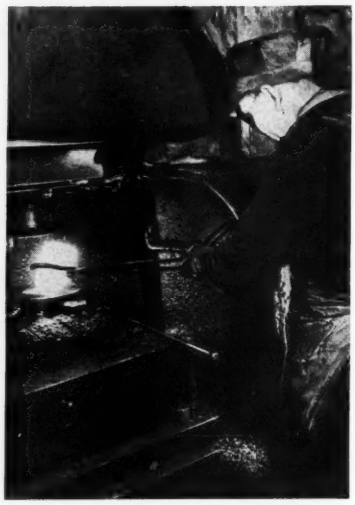
NPA OKs 105 Building Projects

The unemployed in six hardship areas can look for help in the National Production Authority approval of 105 new commercial building projects at an estimated cost of $53.5 million. Materials for the work will be allotted starting July 1. Included will be 20,075 tons of carbon steel and 585,032 pounds of copper.

Areas benefiting from the approval are New York Metropolitan Area, Washington, Boston, Portland-Seattle, Los Angeles and San Francisco.

Two Groups Request End of M-59

Steel strapping order M-59 should be revoked despite the uncertainty of a steel strike, the Steel Strapping Manufacturers Industry Advisory Committee told the National Production Authority. NPA wants the order in effect until the labor dispute is settled, after which it would decide upon the committee's request. The Small Defense Plants Administration also has requested revocation of order M-59.



Dodge Forges Shells

Solid cylinders of red-hot metal are forged into 81-mm mortar shell bodies in three operations on this machine at the Dodge Forge plant in Detroit. Produced in quantity on forging presses alongside civilian automotive work, the shells are shipped in large lots for other operations and ultimate assembly

Forging Bars Still Tight

Outlook is better than month ago, but large quality bars are especially scarce

FORGE shops are getting a little more billet and bar tonnage currently than a month ago but they still are having a tough time getting all of their first and second quarter CMP tickets placed with the mills.

Forging quality bars are about the tightest item in the supply product list at the moment. While a little easing in the smaller sizes is reported here and there, large sizes are extremely tight and overall demand continues far in excess of available supply. The chief reason for this is the fact increasing tonnage of the type of steel used in commercial forge shops is going for production of shells.

Wherever possible the forge shops are using ordinary carbon steel, but utilization is restricted. NPA has been requested to assist the industry in obtaining more hot-rolled carbon bars and billets. In January, the forging industry operated at only 54 per cent of capacity, and it will require more steel than it is now getting if it is to prevent further increases in order backlogs.

Suggestion has been made to NPA to extend the 45-day steel inventory limitation of the industry to 90 days for carbon and low alloy steel and 120 days for high density and stainless steels. In view of the importance of forgings in production of such military items as jet engines, tanks and ammunition, it is thought NPA will give serious consideration to the inventory suggestion.

Indications are the supply of low alloy carbon steel for the industry in the first quarter was approximately in balance with requirements but carbon bars will be in tight supply through second quarter. The bar mills expect heavy order carryover from first to second quarter. Supply of high density stainless steels in second quarter may be a little larger than in the first three months of the year, it is reported.

Tin Platers Ask Quota Lift

Tin plate manufacturers may receive extra materials allotments in the second quarter and are asking for lifting of all quota restrictions on items under the tin container order, M-25. Unless the National Production Authority lifts the quota limitations, some mills may be forced to lay off skilled workmen, the Tin Plate Industry Advisory Committee told the agency.

NPA says it is studying a revision of order M-25 which would release about 103,000 tons of secondary products.

Tractor Industry Faces Layoff

The tractor and allied equipment industry will be forced to layoff 30 to 40 per cent of its employees and cut back its production of tractors for defense needs unless it receives more controlled materials. Unbalance in the amounts of materials now allotted is also a serious problem, the industry committee told National Production Authority.

NPA told the committee that it will request materials for the industry in the third quarter on the basis of annual production of 58,000

units, or 14,510 for the quarter. Second quarter allotments were on a basis of only 34,000 units. Current claimant agencies' requests total 64,571.

Steel 'Clearing' Eases Ships

"Clearing up" of the steel situation was cited by Vice Adm. E. L. Cochran, Maritime Administrator, in announcing that the administration is preparing to ask Congress for about $150 million to be used in building anothe 15 seagoing ships.

Congress originally voted to authorize 50 of these high speed cargo ships but provided funds for only 35. Contracts for all 35 have been let and deliveries are scheduled to start in May.

Admiral Cochran told a House Appropriations Committee that his agency had not pressed for funds for the remaining 15 "because of the steel situation. However," he continued, "that has now cleared up and we are putting together a request for a supplemental appropriation to cover that 15."

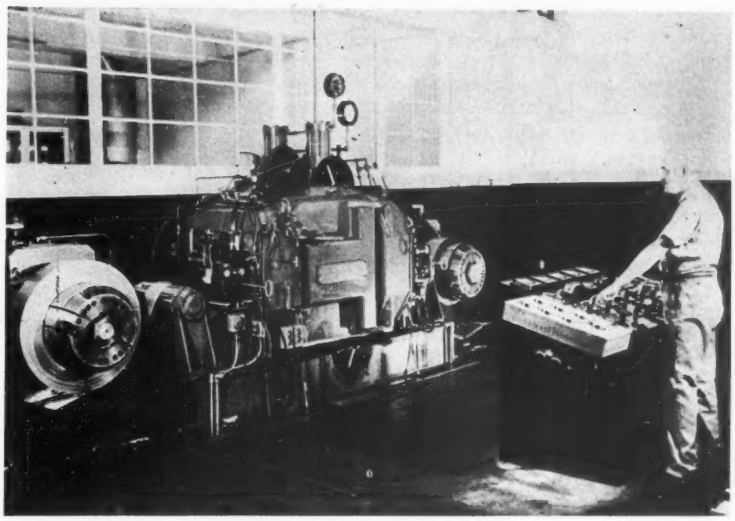
Meanwhile Plant Bros. Drydock Co., general and marine contracting firm of San Francisco, has obtained a 20 year lease from the U. S. Navy on the former General Engineering & Drydock Co. shipyard in Alameda, California. First operations, expected about Apr. 1 will be ship repair work and heavy industrial and steel fabrication. Later some medium-sized new construction is expected.

Operations will be carried on under the name of Independent Engineering & Drydock Co., headed by Thomas G. Plant Jr.

GE Sales Up; Net Profit Down

General Electric Co. reports that 1951 sales reached 18 per cent higher than in 1950 and pre-tax earnings went 12 per cent higher, but the net earnings after taxes left the company 20 per cent below the $173,424,000 earned in 1950.

A 41 per cent increase in federal taxes, which, according to GE President Ralph J. Cordiner, is nearing "confiscatory levels," accounted for the decrease. Net profit was $138,117,000.



Atlas Steels Installs Sendzimir Unit

Supplementing the largest commercial hot Sendzimir strip mill ever built, Atlas Steels Ltd., Welland, Ontario, Canada is installing a cold Sendzimir unit for stainless cold-rolled strip production. Intermediate annealing and descaling lines are much simplified with the heavy reductions possible on the cold mill. Shown is a similar cold mill at Thompson Wire Co. Mill, Boston

Extra Steel: Premium Prices Deter Consumers

NPA's increase in first-quarter allotments of carbon steel to 51 codes of consumer durables producers isn't as generous as it might sound.

Most of this steel can be bought only from premium price mills or from warehouses at warehouse prices. That factor alone will keep many consumers from cashing their supplementary tickets for cold-rolled sheet and strip, hot-rolled strip, tin mill black plate, welded carbon mechanical tubing and hand mill hot-rolled sheets. With a plan brewing to allow bigger advance allotments and higher final allotments, the tendency to hold off in buying could gain strength.

Diverted Capacity — Plate demand is a big reason more regular-price hot-rolled sheet and strip aren't available. Plate production is now at a rate of 800,000 tons monthly—or 9.6 million tons a year. About 2 million tons of plates are being rolled annually on continuous strip mills.

With that sheet and strip capacity devoted to plates, few regular-price mills have vacant hot-rolled sheet space at present. Whether they will have the space in the second quarter will be learned at the April meeting of the Production Directive Committee.

No Drastic Change—Cold-rolled sheets available for supplemental allotments are largely restricted to what regular-price mills can roll. Few higher-price mills make cold-rolled sheets.

There is little surplus cold-rolled sheet tonnage available now; this situation shouldn't change drastically in the second quarter.

Matter of Price—Some consumers will be able to absorb premium prices for extra steel. But those coming to NPA's Iron & Steel Division for more steel say they can't afford the prices of the marginal mills and warehouses they are referred to.

Last week in Washington, for example, an outfit with a defense-support contract from General Services Administration sought help from NPA in lining up 1750 tons of hot-rolled sheets required. Contract price of the steel was based on the regular-price sheet market. To place the tonnage, a $40 a ton price differential was necessary—a $70,000 premium on the 1750 tons. With the entire contract amounting to about $400,000,

the contractor couldn't come out whole on the deal and was considering cancellation of the contract.

Taut or Slack—Requests for spot assistance in obtaining steel for defense jobs have fallen off to almost nothing, NPA finds. Relatively few firms filed applications for hardship allotments by the Mar. 13 deadline. Companies seeking assistance after that date will receive smaller supplemental allotments than those who filed before the deadline, says Henry H. Fowler, NPA administrator.

A-C Project To Cost $15 Million

A $15 million plan to expand the Springfield, Ill., works of the Allis-Chalmers Mfg. Co. will be undertaken before mid-summer. Adding over 300,000 square feet of space, the expansion will include facilities for increased production of crawler tractors, motor graders and repair parts.

CF&I Expansion Nearly Complete

Completion of the $1 million expansion of Colorado Fuel & Iron Corp.'s Pueblo wire mill is six months off.

Copperweld Gets Tax Write-off

Copperweld Steel Co., Warren, O., received approval for rapid tax amortization for an investment of $15.2 million for seamless tubing. Certificates for fast tax write-offs approved from Feb. 4 to Feb. 16 involved proposed investments totaling $836.9 million, says the Defense Production Administration.

Among the approvals were certificates to ten nitrogen producers for production of 425,000 short tons of contained nitrogen at an estimated cost of $114.5 million.

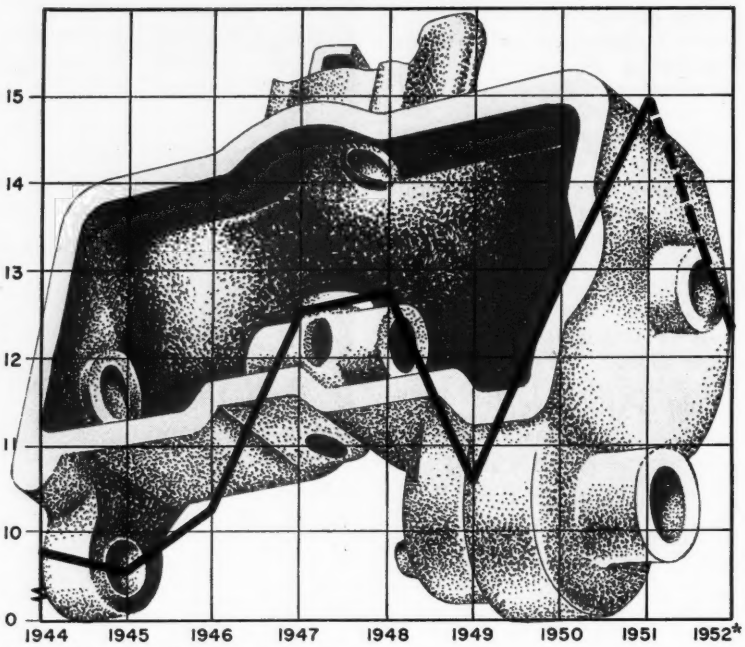
Globe Iron To Build Plant

An electric furnace plant to produce ferroalloys will be placed under construction in the next two months in Washington county, Ohio, by Globe Iron Co., Jackson, O.

The new plant will be on the Muskingum river, five miles north of Beverly, and will cost $2 million. It is expected to be in operation by early 1953.

Gray Iron Barometer: After a Slump an Improvement

(Millions of Net Tons)



*Estimated. Source: U.S. Bureau of Census

Business Gage Rallies

Gray iron castings production shows signs of improvement after yearend dip

RALLYING is an industrial barometer, the production of gray iron castings.

After a low month last December, the gray iron foundries experienced a firming trend in late January that has gained momentum since. They are now producing at about 80 per cent of the record rate in the first half of 1951, and, according to Donald H. Workman, executive vice president of the Gray Iron Founders Society in Cleveland, should turn out 12 to 12.5 million tons of castings in 1952 (see the chart). That won't match the peak performance last year when nearly 15 million tons were produced, but it will compare favorably with other good years.

Bellwether — Gray iron output serves as a good economic indicator because the appliance, auto, machine tool and other users must order the castings some three to six months before their end products are finished. Thus, the sluggish output in the foundries last December foretold the mild industrial dip we have experienced last month and this. Does the rising gray iron activity now presage a new peak in general industrial operations by next summer?

The pickup in gray iron castings production is caused by the government's relaxation of some restrictions on consumer durable output, especially automobiles, plus new ordering by customers after an inventory shake-out that began late in the fourth quarter of 1951.

Middleweights and Lower—The light and intermediate gray iron castings felt the brunt of the slump. Heavy products, such as used for machinery, have enjoyed a steady demand all along. Machinery, notably machine tool, customers are among the best sources for the foundries defense and defense-related work. Although that type of production is increasing, it still is probably less than half, on the average, of the industry's output.

At the moment, gray iron shops can get all the pig iron, cast scrap and coke they need, although supplies could quickly become inadequate if production rises even more sharply. Nickel remains one of the most difficult alloying elements to obtain.

Ships More Extrusions

Revere, busy on defense, dips into inventories to move more aluminum products

REVERE Copper & Brass Inc.'s shipments of aluminum tube and extruded shapes actually increased somewhat in 1951 over 1950 but largely by inventory depletion, reports Stanley H. Wilson, sales manager, Aluminum Division, Baltimore.

"We used all the metal allocated to us by NPA but could have used considerably more," Mr. Wilson said. "Established producers had to share through NPA allocations with some 30 new extruders, few of whom produce hard and heat-treated alloys. Revere does produce hard and heat-treated alloys.

"We participated 100 per cent in World War II. We are now heavily engaged in defense work and are carrying our share of the defense load. The outlook for 1952 is better rather than worse because of the anticipated improvement in the metal supply in the second half of the year. Our confidence in the future is demonstrated by aluminum expansion programs in Baltimore, Detroit and Los Angeles."

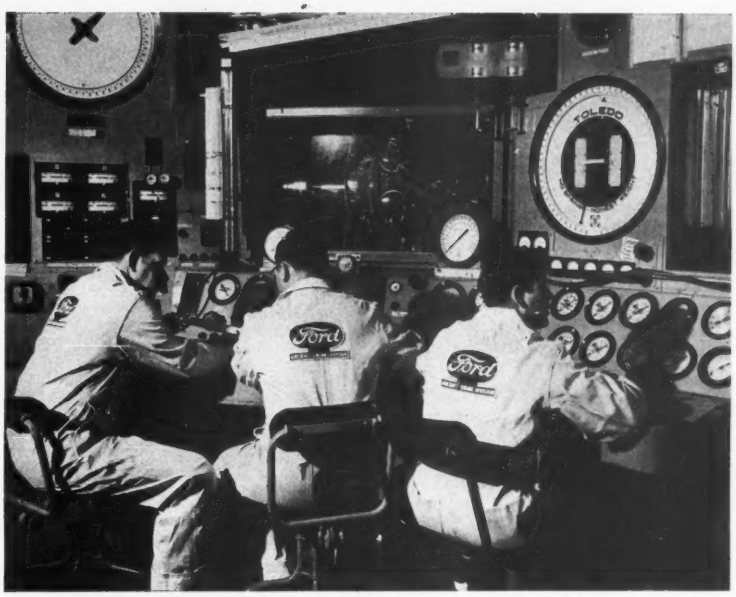
Mr. Wilson's statement followed publication of a report in STEEL (March 10, page 78) to the effect that Revere's aluminum extrusion business was off in 1951 and that a further decline was in prospect for 1952.

Western Metal Expansion Plans

More than $200 million is being spent on development of western metal resources. San Manuel Copper Corp., subsidiary of Magma Copper Co., will spend $100 million to develop a low grade copper ore deposit near Tucson, Ariz. Production will reach 30,000 tons of copper ore daily.

Near Bislice, Ariz., Phelps-Dodge Corp. will spend $25 million to develop its east copper ore body. Underway is the $32 million Anaconda Copper project near Yerington, Nev., and Kennecott Copper Corp., has earmarked $7 million for equipment and construction at its Ruth copper mine near Ely.

Four projects are underway at Henderson, Nev. Manganese, Inc. has completed one-third of its $2.5 million concentrating and nodulizing plant; Titanium Metals Corp. is constructing a $14 million plant to produce 3600 tons of titanium metal yearly; Western Electro Chemical Co. is constructing a $4 million plant to produce chlorate, perchlorate and manganese dioxide. Construction will start soon on a $3 million reduction plant for Pioche Manganese Co. in the same area.



Engineers Gathered 'Round

First Wasp Major engine built by Ford Motor Co.'s Aircraft Engine Division in Chicago undergoes a calibration check by test engineers. The engine, which completed a five-hour test check successfully, gets 150 more hours of testing before release. In Chicago this week another group of engineers—the American Society of Tool Engineers—is holding its 20th annual meeting

Large Rectifier Orders Placed

Orders totaling $7 million for rectifiers were announced by General Electric Co. and Westinghouse Electric Corp. this week.

Westinghouse will produce more than $5 million in assemblies of ignitron rectifier tubes to be installed in a new Reynolds Metals Co. aluminum reduction plant near Arkadelphia, Ark.

When completed the expected capacity of the plant will be 110 million pounds of aluminum pig yearly.

General Electric will produce $2 million worth of rectifiers for the Atomic Energy Commission which are expected to be delivered to the AEC within a year.

Chalmette One-fourth Complete

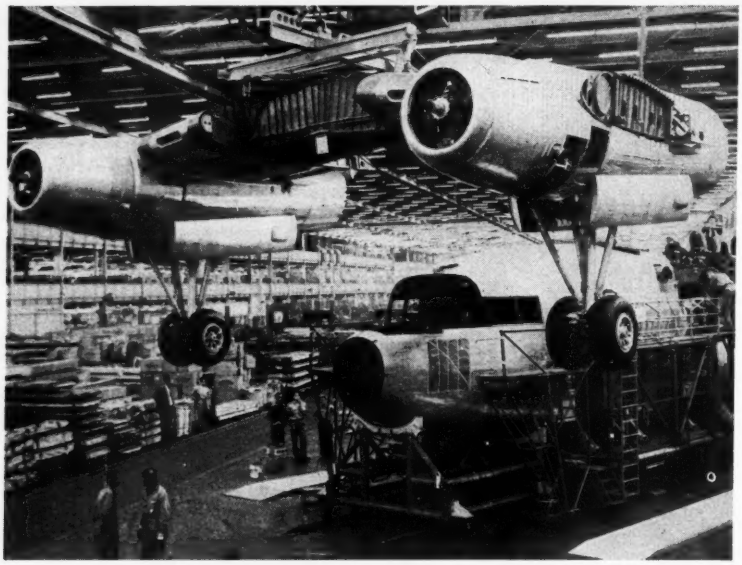
The second of eight new potlines at Kaiser Aluminum & Chemical Corp.'s Chalmette primary aluminum plant near New Orleans began production on Mar. 5, just 85 days after the first unit became active.

At present the plant is one-fourth complete, with a present capacity of 100 million pounds a year.

At the same time, power began to flow from another unit of the proposed 478,000 kilowatt power plant at Chalmette. Enough power is being generated now to run a city of a quarter-million population.

Ferro Enters Powdered Metals

Ferro Corp. moves into the powdered metals field by acquiring 50 per cent interest in the Wel-Met Co. Wel-Met, started in 1946, has a plant at Kent, O. and another built last year at Salem, Ind. Purchase price of the interest was not revealed.



A FAIRCHILD C-119 NEARS COMPLETION AT WILLOW RUN
. . . 30 will use Fairchild-supplied parts; No. 31 will be K-F's own

Small Firms On Board With More Navy Contracts

NAVY PROCUREMENT is focusing the long glass on small business firms. Each month an increasing number of Navy prime contracts went to small firms during the first six months of fiscal 1952. And the trend is expected to continue, says the Defense Department. An example of this small business policy is the recent announcement that three shipbuilding firms, classified as "small business," will build 194 deck cargo barges valued at $3.5 million for the Navy.

Prime Navy contracts awarded to small businesses climbed from an average of 27,600 a month in 1950 to 41,700 a month currently. The average monthly amount of prime contracts awarded small business currently is about $190 million, says the Defense Department.

If lack of sufficient defense subcontracts is one of your problems, check over the table at the bottom of the page. It's a selection from the latest contracts valued at $250,000 and over awarded to metalworking companies by government procurent agencies.

PRODUCT	CONTRACTOR
Lathes	South Bend Lathes Works, South Bend, Ind.
	C. H. Gosiger Machinery Co., Dayton, O.
External Gear Shaver	National Broach & Machine Co., Detroit
Gauge and Weight Machines	Waterbury Farrell Foundry & Machine Co., Waterbury, Conn.
Machinery for Gun Manufacturing	Savage Arms Corp., Utica, N. Y.
Processing Machines	Houston-Fearless Corp., Los Angeles
Machinery & Equipment	Parker Appliance Co., Cleveland
Inverters	Leland Electric Co., Dayton, O.
Relays	Mazpeth Telephone & Radio Corp., Brooklyn, N. Y.
Receiver-Transmitter	Delco Radio Div., General Motors Corp., Detroit
Mountings	Kings Electronics, Brooklyn, N. Y.
Transistors	Western Electric Co., New York
Transcribers	Soundscriber Corp., New Haven, Conn.
Public Address Set	David Bogen Co. Inc., New York
Parts for Radio Set	Raytheon Mfg. Co., Waltham, Mass.
Radar Set	Raytheon Mfg. Co., Waltham, Mass.
Radio Set	Emerson Radio & Phonograph Corp., New York
Batteries	Manufacturers Battery Co., Madison, Wisc.
Range Finder	Ternstedt Div., General Motors Corp., Detroit
Steel Cartridge Cases	Norris-Thermadore Corp., Vernon, Calif.
Parts for Fuzes	Harvil Corp., Los Angeles
Trailers	Euclid Machinery Co., Cleveland, O.
	Strick Co., Philadelphia
Tanks, T48	Chrysler Corp., Detroit
Aircraft Main Fuselages	Oliver Corp., Chicago
Starters	Jack & Heintz Inc., Cleveland
Airspeed Indicators	Kollsman Instrument Corp., Elmhurst, N. Y.
Wheel & Brakes Assemblies	Bendix Aviation Corp., Detroit
Hydraulic Pumps	Vickers Div., Sperry Corp., Detroit
Parts for Pumps, Compressors, Turbines	Worthington Pump & Machinery Corp., Harrison, N. J.
Refrigerators	Howard Refrigerator Co., Philadelphia
Heaters	Perfection Stove Co., Cleveland
Fire Bombs	Magic Chef Inc., St. Louis

Kaiser-Frazer Splits Forces

Kaiser-Frazer Corp. president Edgar F. Kaiser says that facilities at the huge Willow Run plant will be divided equally between civilian and military goods during 1952. Further into defense work than any other carmaker, K-F presently employs about 17,000 workers divided into three groups: One third on autobuilding, one third on aircraft and one third working on both.

The first Fairchild C-119 built by Kaiser-Frazer is now in Army hands. As the pace is stepped up, the company will complete the tooling job for production of Chase C-123 assault transport planes. Emphasis will shift from the C-119 to the C-123 late this year.

K-F officials are quick to point out, however, that the company is primarily an auto maker. All diversification, such as airplanes, will be centered in the Chase organization, partially owned by Kaiser-Frazer.

Alco 1951 Backlog Set Record

The American Locomotive Co. reports that at the end of 1951 it had the largest backlog of orders in the company's history. More than $98 million worth of regular products and some $900 million worth of defense orders were unfilled despite higher shipments in all divisions during the year.

Reflecting an overall increase in profits, the company shipped a new high quantity and dollar value of diesel-electric locomotives. All divisions operated at or near capacity level. The company's annual report says that the outlook for next year is bright if sufficient materials are available.

SDPA Names 3 Regional Boards

The first three of 13 regional advisory boards for the Small Defense Plants Administration have been established in Seattle, San Francisco and Boston, Telford Taylor, small defense plants administrator announced. Each board will include one or more representatives from each state in the region.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

CONSTRUCTION—NPA Order M-100 issued Mar. 6, 1952, is a new housing construction order which is separate from NPA's overall construction regulations. M-100 relaxes certain restrictions on use of steel but tightens restrictions on use of copper. The new order contains substantially all of the provisions previously in NPA Order M-4A, CMP Regulation 6 and Direction 1 to Reg. 6. These orders have been replaced by the new overall construction regulation, CMP Reg. 6, revised. Other changes are: Amendment of Direction 4 to CMP Reg. 6, issuance of Direction 5 to CMP Reg. 6, and amendment of NPA Delegation 14.

MRO FOR EXPORT—Amendment of Mar. 6, 1952, of NPA Order M-79 reincludes machine tool replacement parts in that order, which provides priority assistance in procuring certain maintenance, repair and operating supplies for export. Replacement parts for machine tools were removed from the order on Nov. 19, 1951. The amendment also allows makers of machine tool replacement parts to use the last half of 1951 as the base period in computing their MRO quotas.

MACHINE TOOLS—NPA Order M-101 issued Mar. 7, 1952, controls distribution of used and imported metalworking equipment. Machine tool dealers and rebuilders are required to report: (1) Inventories of used and imported machines to NPA within 15 days of notification to do so by the agency; (2) acquisition of an additional used or imported machine tool within three days of purchase; and (3) disposal of a used or imported machine tool within three days of sale. Thirty-six types of metalworking equipment are affected, but only those priced at $2000 or more and not more than 25 years old are covered. M-101 was effective Mar. 7, 1952.

ZINC—Amendment of Mar. 7, 1952, of NPA Order M-9 permits quarterly as well as monthly allocation of zinc. This gives exporters the necessary working time in which to arrange for shipping. The amended M-9 incorporates without change the controls of the other zinc orders, including M-15 which governs the use of zinc and M-37 which controls zinc scrap and toll agreements. The latter two regulations were revoked simultaneously with issuance of the amendment to M-9.

Price Regulations

COPPER SCRAP — Amendment 2 to Ceiling Price Regulation 46 sets ceiling on dealer-to-dealer sales of copper scrap and copper alloy scrap. These ceilings are identical with ceilings already provided for other persons. Amendment 2 was effective Mar. 12, 1952.

MACHINERY SALES—Amendment 32 to Ceiling Price Regulation 30 grants manufacturers of machinery and related goods the option of establishing their own retail ceilings under the same regulation they used to establish ceiling prices to all other classes of purchasers. Previously, manufacturers were required to establish ceiling prices for their own retail sales under the General Ceiling Price Regulation, even though their ceilings for sales to all other classes of buyers were determined under CPR 30. Amendment 32 was effective Mar. 15, 1952.

Lockheed's Heavy Press

Heavy equipment makes lighter parts possible when this 8000-ton triple action hydraulic press swings into action at Lockheed's Burbank, Calif., plant. Manufactured by Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., it stamps out integrated airframe sections formerly made of several subassembled parts

Appointments in Washington

Roy W. Ewertz, management and industrial consultant for the American Machine & Foundry Corp., was appointed director of the Ordnance & Shipbuilding Division, National Production Authority.

Paul O. Hamer, former superintendent of the Point Lick Mine, Hatfield-Campbell Creek Coal Co., was appointed as an industrial specialist for the Industry Finance Division, Defense Solid Fuels Administration. Mr. Hammer will assist in analyzing and making recommendations on applications for rapid tax amortization certificates by coal and coke producers.

G. Barrett Herr, member of the Materials & Supplies Committee of the American Gas Association, was named deputy director of the Gas Facilities Division, Petroleum Administration for Defense.

Renegotiation Aid Published

Latest aid proffered the harrassed defense contractor—a *Renegotiation Manual.* Published by Vincent F. Callahan and Frederick Hollowell, editors of the weekly *Renegotiation Letter,* the *Manual* contains material describing renegotiation, whom it affects, how it is conducted, obligations and rights of defense contractors, etc. Also included are procedural regulations and history of previous renegotiation litigation before the Tax Court of the United States.

Copies may be purchased at $7.50 from the Renegotiation Manual, 319 Evans building, Washington 5.

DPA Approves Three More Pools

These three additional defense production pools are approved:

Specified Finishes Inc., Chicago, with seven companies and 435 employees; and Mil-Fin Inc., Waukegan, Ill., with five companies and 600 employees. Both pools are equipped to produce "protective coatings" such as paints, varnishes, enamels, lacquers, other finishes.

The third production pool is the Florida Wood Co-operative, Miami, with 14 companies and 642 workers. That pool can produce milled or processed items made of wood.

First production pool authorized during the present emergency was Omaha Industries Inc., Omaha, Neb., when 100 firms totaling 5300 employees pooled their production facilities and know-how.

The other seven production pools formerly approved by DPA are:

Coordinated Manufacturers, of Santa Clara County, San Jose, Cal., with 45 firms and 457 employees; Peoria Consolidated Manufacturers, Peoria, Ill., with 19 firms and 725 employees; Greater New York Mfg. Pool, New York, with 77 firms and more than 1,200 employees; Central California War Industries Inc., Fresno, Cal., with 22 firms and 815 employees; Illinois Manufacturers Defense Pool Inc., Chicago, with 29 firms and 1,200 employees; Dade County Industries, Inc., Miami, Fla., with 7 firms and 311 employees; and the Small Manufacturers Cooperative, Bridgeport, Conn., with 5 firms and 411 employees.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

PRIZE . . . land government contract

PRICE RISE . . . learn costs are higher

REVISE? . . . seek pricing relief

SURPRISE! . . . find appeal right cut off

REMEDY is being sought in Congress to relieve contractors from the baneful Wunderlich decision of the Supreme Court last November.

This is the decision which, said dissenting Justice Jackson, could "make a tyrant out of every government contracting officer." The Senate Judiciary Committee has been holding hearings on the McCarren bill, S.2487, and the House Judiciary Committee will get into the matter this month.

Dispute—In the Wunderlich Contracting Co. case there was a dispute about the amount due the contractor under a change order. The Court of Claims found the cost-computing method used by the Interior Department officer in this case was "arbitrary and capricious and grossly erroneous."

Then the Supreme Court reversed the decision, pointing out that the contract contained the usual provision that the decision of the contracting officer or the head of the government department was to be final on disputed points. The Supreme Court held that a government man's decision under such a contract could not be set aside unless it was shown that the designated government officer was guilty of fraud. The court defines fraud as "conscious wrongdoing, an attempt to cheat or to be dishonest."

Parallel—Sometime back, in the Moorman case, the Supreme Court held there could be no appeal from the decision of the contracting officer or his department head on disputed questions of law. Now the Wunderlich decision prohibits him from appealing decisions on disputed questions of fact.

Many congressmen feel that not only is such a situation unfair to contractors, but that if allowed to continue it will discourage business firms from accepting government contracts. They seek the drafting of a new law which will at least restore the contractor's former right to a court appeal.

By the Numbers . . .

Twist drills, wire nails, galvanized steel sheets and chain are among the products exhibited in a "Chamber of Horrors" assembled by the Herbert Subcommittee, House Armed Services Committee, to dramatize the need for a single catalog system in the armed services.

Fifteen different catalogs are now used by the armed services in their procurement, says Rep. Herbert, so that the same item is often bought under different names and identification numbers. This, he says, leads to waste of taxpayers' money through inefficient buying and distribution.

Twist drills: The caption for this exhibit points out that identical twist drills are bought by the Army, Navy and Air Force under three different Munitions Board specifications and identification numbers.

Nails: The caption under this exhibit states that the Navy buys nails to diameters expressed in decimals of an inch, while the Army specifies gage sizes.

Galvanized nails: The caption for this exhibit says the Navy buys nails with "zinc finish," whereas the Air Force buys the same identical product as "galvanized finish."

Galvanized sheets: The Navy buys to Navy specifications and the Army and Air Force to Federal specifications. In issuing galvanized sheets, the Navy issues by the pound, the Air Force by the square foot, and the Army by stock-size sheets.

Chain: The Navy issues by weight, and the Army and Air Force by feet.

Electric lamp bulbs: Each service buys its own lamps. The subcommittee thinks that in view of the vast quantities of light bulbs procured, a better price could be obtained by vesting the entire procurement in one place, and that economies could be obtained by having a common distribution system.

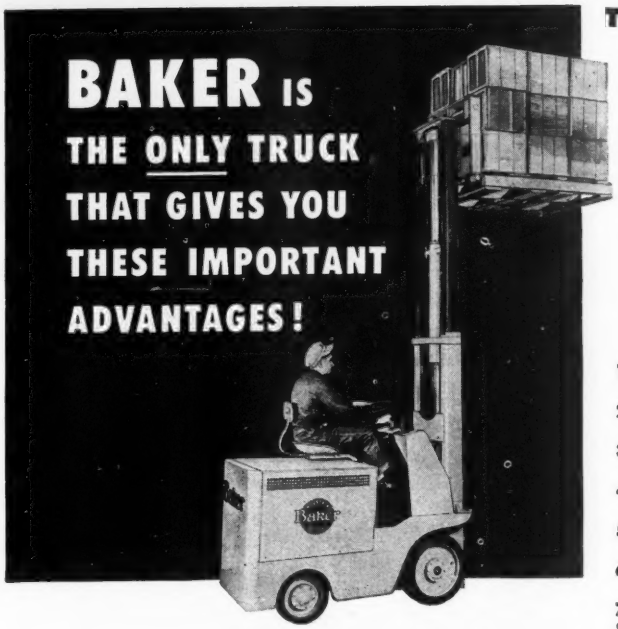
The Herbert group is trying to write a new law which will lop off all these bad practices through a single set of names and numbers for identical items.

Fraction of Cost . . .

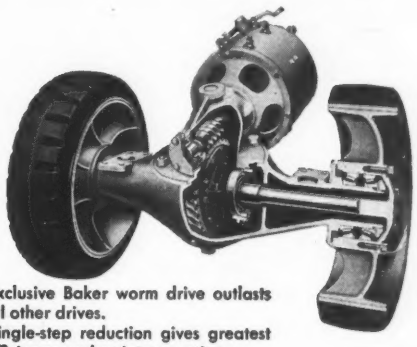
Many of the surplus machine tools which the government donated or sold to universities and other institutions at a fraction of their cost after World War II are returning to military production.

J. K. Woll, on leave as president, Gary Machinery Co., Canton, O., to serve in NPA's Metalworking Equipment Division as chief, Used and Available Tools Section, and chairman, Institutional Allocation Board, tells STEEL that 327 pieces of industrial equipment recently obtained from schools and institutions have been allocated to armed services and/or their contractors.

The government paid these institutions exactly what the institutions paid to the government for these machines—$51,478.99. Had the government purchased these tools new in today's market, says Mr. Woll, cost would be $1,078,240.

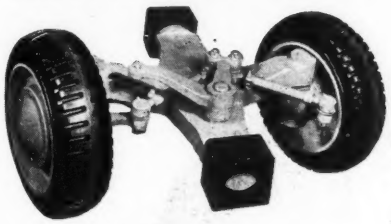


THE MOST EFFICIENT POWER AXLE FOR INDUSTRIAL TRUCKS



1. Exclusive Baker worm drive outlasts all other drives.
2. Single-step reduction gives greatest efficiency and quiet operation.
3. Rolling contact between worm and worm wheel eliminates sliding friction.
4. Alloy-steel worm and aluminum-bronze worm wheel for strength and low friction.
5. Worm runs on radial and thrust ball bearings to protect against damage from shock loads.
6. Four-bevel-pinion differential doubles tooth contact, distributes load evenly, minimizes maintenance.
7. Efficiency not reduced by wear.
8. High efficiency under heavy loads.
9. Lowest operating cost of any drive.
10. Can be removed from truck in less than 1 hour.
11. Full floating axle shafts easily removed.

THE SIMPLEST TRAILING AXLE FOR INDUSTRIAL TRUCKS



1. Baker patented wide angle steer provides maximum maneuverability.
2. Jumbo-size oil resistant rubber blocks absorb twisting of axle.
3. Complete accommodation to uneven roadways.
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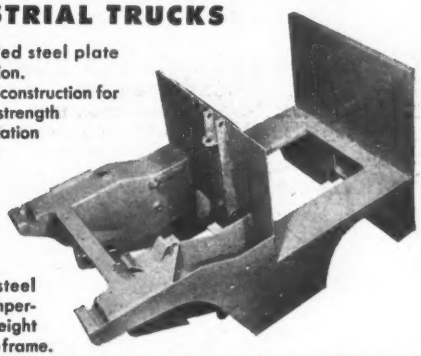
8. Thrust ball bearings and location of knuckle pivots mean easiest, shockless steering.
9. Tapered wheel bearings reduce friction.
10. Wheel removable in 5 minutes by taking off cap and one nut.
11. Trailing axle can be removed from truck in 20 minutes.

THE STRONGEST FRAME FOR INDUSTRIAL TRUCKS

1. All-welded steel plate construction.
2. Box-type construction for greatest strength and utilization of space.



3. Integral steel plate bumper-counterweight welded to frame.
4. Weight scientifically distributed for maximum stability and cantilever effect.
5. Integral oil reservoir.
6. Designed for easy access to truck components requiring maintenance.
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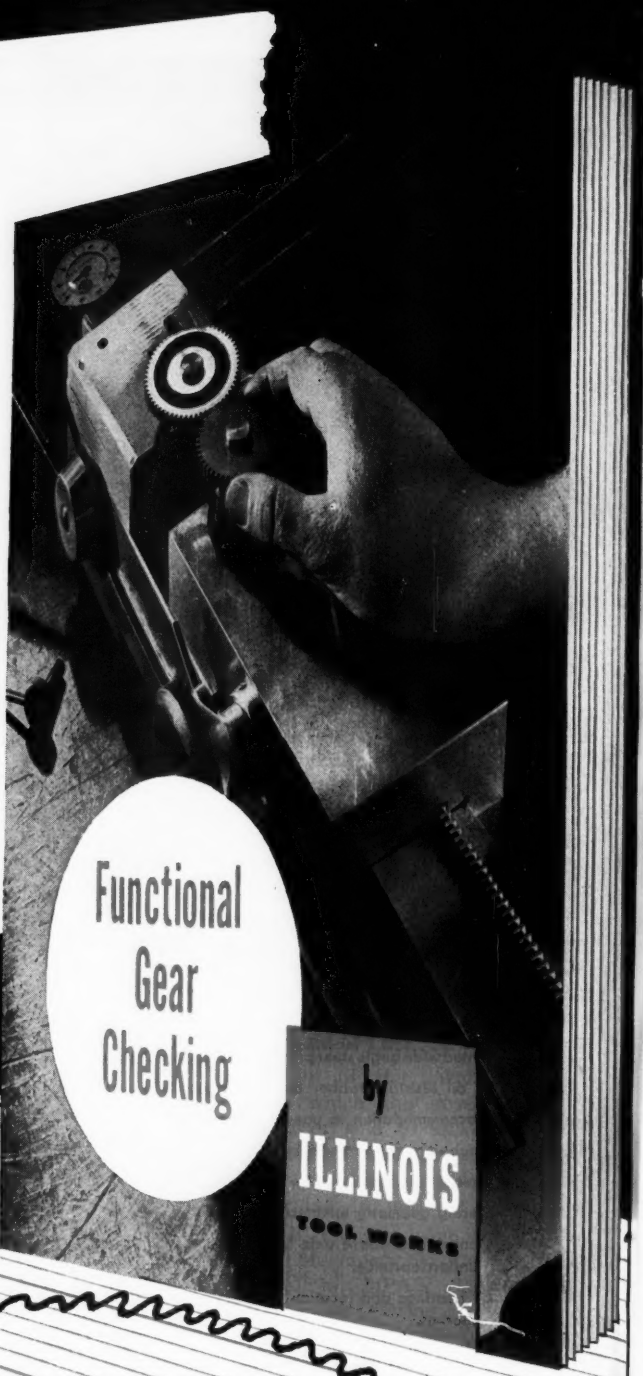
How to control gear quality at lower cost!



See how modern gear checking equipment and techniques will help you reduce inspection costs and scrap losses.

This new booklet describes and illustrates the procedures that you can apply right on your production line . . . procedures that will help you trace the source of gear errors for quick correction. Send for your free copy of "Functional Gear Checking" today!

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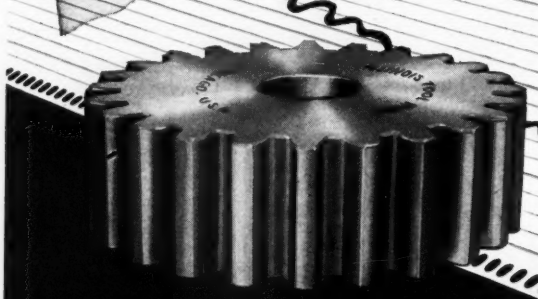

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There's a Treasure in Taconite

Up in the ore country they're going to dig into the vast tonnages of the flint-hard, iron-bearing rock. Timetable for commercial production of taconite is 1955

METALWORKING is forcing development of a process that can do in a few hours what nature needs millions of years to do.

That process is the production of commercial quantities of metallics for the steel industry. Once that was no problem because good iron ore was easily obtainable in what seemed to be unlimited quantities from nature's fabulous storehouse, the Lake Superior region.

Changes—Now some 50 years of normal consumption and abnormal consumption during two World Wars have brought the supply of high quality ore easily scooped out in that area not far from the vanishing point—at a time when metalworking and its steel needs are the largest in history.

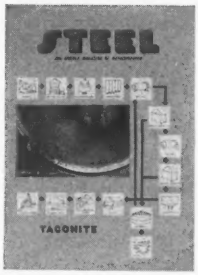
What can be done about the metallics situation? The nation's iron and steel industry started to leave no stone unturned in finding the raw material, and in turning over those stones it found just what it needed to feed its blast furnaces.

Ace in the Hole—Up in the ore country they're going to dig into the vast tonnages of flint-hard, iron bearing rock called taconite. This wasn't economically feasible as long as there was a sufficient supply of direct shipping ores. Lying in the ground undeveloped all this while, the taconite rock was really an ace in the hole.

Now has come the time to play the ace. Three companies are at work on projects to develop the Mesabi Range's taconite, and another company is interested in a similar project, the development of Michigan's reserves of jasper.

These companies have set about to convert the vast stores of low-grade iron bearing rock into a high iron-content pellet. First of the commercial quantities of ore from taconite should flow forth in 1955. Product from the jasper should be available late in 1953.

Outdoing Nature—Someone said taconite is just what today's iron ore was millions of years ago. In outdoing nature, man's process gives a high-quality product. It contains over 60 per cent iron, compared with only about 50 per cent in today's best grade direct shipping ores from the Lake Superior region.



TACONITE pellets rolling out of a balling drum in the cover photo are suggestive of the horn of plenty, emblem of abundance. Perhaps that is a prophetic picture, for there's an almost unlimited supply of raw materials for these pellets

The three in taconite are Erie Mining Co. and Reserve Mining Co., both with executive offices in Cleveland, and United States Steel Co.'s Oliver Iron Mining Division, with headquarters in Duluth.

Set up less than a month ago to develop Michigan jasper is Humboldt Mining Co., with executive office in Cleveland.

(For details of ownership of the four companies see the accompanying table.)

First Move — Reserve Mining made a move last fall to make taconite pellets available in commercial quantities. It announced it would begin immediately to build a 2.5-million-ton-per-year beneficiating plant at Beaver Bay, Minn.

A month ago, Erie Mining applied to the Defense Production Administration for a certificate of necessity covering a $300 million development that ultimately would produce 10.5 million tons of iron concentrate pellets annually on the Mesabi Range northeast of Aurora, Minn.

If Erie's project is undertaken, the initial unit would have an annual capacity of at least 5 million tons, which probably would be attained in four or five years. Construction of additional units would continue until production is at the rate of 10.5 million tons a year.

Raises Its Sights—Two weeks ago, Reserve Mining announced that its program of constructing

WHO'S WHO IN TACONITE AND JASPER

TACONITE

RESERVE MINING CO., Guildhall Bldg., Cleveland

Owners: Republic Steel Corp. 50%
Armco Steel Corp. 50%

ERIE MINING CO., Union Commerce Bldg., Cleveland

Owners: Bethlehem Steel Corp. 45%
The Youngstown Sheet & Tube Co. 45%
Interlake Iron Corp. 7%
Pickands Mather & Co. 3%

OLIVER IRON MINING DIVISION, Wolvin Bldg., Duluth, Minn.

Owner: United States Steel Co. 100%

JASPER

HUMBOLDT MINING CO., Union Commerce Bldg., Cleveland

Owners: The Cleveland-Cliffs Iron Co. 50%
Ford Motor Co. 50%

plants and facilities to produce iron ore pellets from taconite is to be expanded by 50 per cent. This will give it a capacity of 3,750,000 tons instead of 2.5 million.

Furthermore, provision has been made in Reserve's project to enlarge it as required to a 10-million-ton-per-year processing facility.

Reserve expects its 2.5-million ton plant to be completed in 1955, and its additional 1,250,000 tons of capacity to follow in about two years after the first plant goes into operation.

If Reserve's and Erie's two projects are brought to completion they would provide a total of 20.5 million tons of iron concentrate pellets a year from the Lake Superior region. This would be equivalent to 23 per cent of last year's consumption of Lake Superior ore.

Looking Ahead — Oliver Iron Mining hasn't launched into the commercial quantity production of taconite yet. That's possibly because United States Steel is better fixed than some others for ore. Nevertheless, it's alert to the possibilities of taconite.

At Mountain Iron, Minn., it's constructing a pilot taconite beneficiation plant with an annual capacity of 500,000 tons of finished concentrates. At Virginia, Minn., it's building an agglomeration plant to convert concentrates into sizes suitable for shipment and use. Capacity will be 500,000 tons a year.

First step in the mining and concentration of the enormous deposits of Michigan's hematitic jasper which will parallel the development of taconite in Minnesota was the formation three weeks ago of Humboldt Mining Co. At Humboldt, Mich., it will take the crude ore (jasper) from an open pit and pass it through concentrating units. The result will be a product substantially higher in iron content than the ores now being commercially mined in the Lake Superior region.

Ready To Go—Development of the property will begin immediately. First of the concentrating units will be capable of producing 200,000 tons annually. Capacity production of the first unit is expected by late 1953 with a second unit of similar capacity scheduled to be in operation some time in 1955.

At a later date Humboldt plans to build a plant to agglomerate the ore concentrates into pellets suitable for use in both blast furnaces and open hearths. However, shipments of iron concentrates to the Ford Motor Co. will begin as soon as the first concentrating unit is completed.

Getting into position to produce ore concentrates from rock on a commercial scale didn't come about over night. At least once before commercial scale production was attempted, and a plant was erected at Babbitt, Minn., and operated from 1922 to 1924. It was unable to operate at a profit with the equipment and under the conditions existing at that time. Reserve Mining has taken over this plant and is re-equipping it as a complete pilot plant.

A Chance at Last—In the last 30 years a lot of research has been carried on, and it is believed that taconite can be processed at a cost competitive with the open pit, free shipping ores.

Making taconite development a tough problem is first the hardness of the rock. It places a severe strain on all of the equipment used in the handling and processing of it. Three tons of taconite must be processed to obtain one ton of finished product of more than 60 per cent iron. After the iron dust is captured from the rock there is no little problem in agglomerating it into lumps of sufficient stability to withstand handling and shipment to the furnace.

Ore for All—Despite all the obstacles the whole taconite program has advanced far enough that a Cleveland ore man said: "There'll be enough ore." He has plenty of reasons to think so. Erie Mining and Reserve Mining already are preparing to spend $460 million. Add to that what Oliver Iron Mining and Humboldt Mining will spend. Then consider that the Great Lakes fleet is getting a number of new ore boats—vessels so long that they can't be used anywhere but on those lakes.

They add up to pretty good proof that the Lake Superior region will be a substantial source of ore for many years to come, thanks to a treasure of taconite.

A-C To Build Taconite Crusher

A giant crusher to smash taconite for Reserve Mining Co. is to be built at Milwaukee by Allis-Chalmers Mfg. Co.

The crusher will be located at Reserve's taconite pit at Babbitt, Minn. The taconite, or iron bearing rock, will be crushed there and shipped by rail to the processing plant Reserve is to build near Beaver Bay, about 55 miles east of Duluth.

Because of the size of the crusher, two years will be needed to build it. Approximately four stories high, the crusher will weigh more than 1,250,000 pounds and will be driven by two 500-hp motors. Capacity will be 3500 tons an hour.

Lake Ore Season Nears

New boats will help as iron ore carriers try for 96-million-ton year

ORE CARRIERS on the Great Lakes are fitting out for the 1952 shipping season. Prospects are good for an early start: At least as early as last year's date, Apr. 6.

It'll have to be a long season if the carriers are to bring down anywhere near the government's proposed goal of 96 million tons. Lake

ORE BOATS LIE IN WAITING
. . . season may open early again

men are more cautious and promise a "better-than-90-million-ton season, if the weather is good."

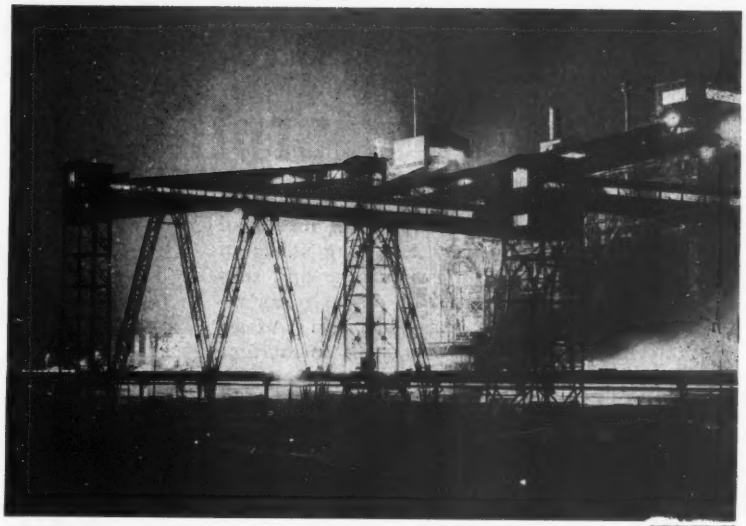
Biggest Yet—The ore carrying fleet will feel the impetus of an expansion program which, when complete, will bring the largest single addition of tonnage in the history of the Great Lakes ore fleet. This program, undertaken to compensate for the expansion in the steel industry, consists of 14 new boats and 5 conversion boats. Of these, four will be ready at the opening of the 1952 season: *Cliffs Victory, Tom M. Girdler, Charles M. White* and *Troy H. Browning.*

Ten more will go into service during the season: *Philip R. Clarke, Arthur M. Anderson, C. J. Callaway, Elton Hoyt 2nd, J. L. Mauthe, E. P. Greene, Charles L. Hutchinson, Johnstown* and two as yet unnamed boats. Five more carriers in the program will not be ready until next season.

More Tons Per Bottom — By largest single tonnage addition is not meant the addition of the greatest number of boats. Larger capacities and better propulsion units gives the tonnage distinction to the present program over the expansion during World War II. At that time boats of 15,000 to 16,000-ton capacities were added with slower reciprocating engine units. The newer boats are in the 18,000 to 19,000-ton class and latest turbine propulsion units are incorporated.

These Great Lakes ore carriers will add a total of about 13.4 million tons annually of carrying capacity, 9,720,000 tons at most this season. That, plus the highest stockpiles at lower lake ports since 1942, gives room for optimism. As of Mar. 1, 1952 there were about 28.5 million tons of iron ore at lower lake ports, compared with 26,745,393 tons in Mar. 1, 1951, and 27.5 million tons in 1942.

U. S. Steel Corp. has continued its all-rail ore shipments since the end of the 1951 shipping season. Iron ore has been moved by rail at a rate of 100,000 tons a month in the winter. During the last open shipping season, some 2.7 million tons were moved by all-rail operations. These movements are made in the same type hopper cars as are used to transport ore from the mines to upper lake ports.



Wide World

Night Shall Pass in Germany's Ruhr Valley

A bare seven years after the dark days of constant bombing by Allied planes, the Ruhr valley is making a comeback as the leading European industrial area. German steel mills are large contributors to the West European defense organization as they make thousands of tons of steel daily in plants like this

Foreign Aid: No Longer an 'If' for U.S.

PRESIDENT TRUMAN's "Program for Peace" carries a price tag of $7.9 billion for foreign aid in fiscal 1953. Regardless of how big an ax Congress takes to the President's proposal, it is certain that a large sum of money will be voted for that purpose.

Much of the foreign aid will come back to American business in the form of orders for defense and defense-supporting materiel.

Prodigious Plan—President Truman asked for $5350 million for direct military aid, $1819 million for defense support and $656 million for economic and technical aid. The balance of $75 million would be required for administrative purposes. Biggest share of aid would go to Europe, $5889 million.

An indicator of what the foreign aid programs means to American business is the $1056 million in U. S. exports under the Mutual Defense Assistance programs in 1951. American Tariff League Inc. says "The high dollar volume of U. S. exports in 1951 was accounted for, in large measure, by a continued and substantial outflow of economic aid shipments under . . . foreign economic aid activities."

Small Business Goes Abroad—Small business is coming in for a greater share of this export business, too. The Select Committee on Small Business of the House of Representatives reports that during the second quarter of 1951 small business concerns, both manufacturing and non-manufacturing, received 67.89 per cent of total ECA-financed orders compared to 49.5 per cent in May to June, 1949.

U.S. Tools For French Jet

In the hands of the French aircraft industry, $5 million worth of American-supplied machine tools produced a jet fighter, the "Mystere," which out-performed an American Sabre jet during recent tests.

Exact performance data on the new Mystere is still classified, but American test pilots who flew the pre-production model report the plane is more maneuverable at high speeds than the Sabre and better at braking while landing. By the end of 1952, the French expect to be making 30 jets a month.

In defense of the Sabre, officials point out the Mystere is a much newer plane than the run-of-the-production-line Sabres in the test.

Reduce the use of critical alloys in gas turbine structures

N-A-X AC9115 ALLOY STEEL offers a means of reducing the use of critical alloy steels of the "stainless" type in gas turbine and similar applications. In specific cases it has replaced over half the amount of strategic material originally required, with no sacrifice of quality.

N-A-X AC9115 ALLOY STEEL has high strength and toughness values at temperatures ranging from —70° F. to +1,000° F. It can be readily cold formed into the most difficult shapes; its response to welding by any process is excellent. It must, however, be suitably coated for protection against cold or hot corrosion.

N-A-X AC9115 ALLOY STEEL is available in bars as well as flat rolled products. Investigate the outstanding properties and characteristics of this steel and, through its use, conserve the critical material so necessary to our nation.

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NATIONAL STEEL CORPORATION

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

King Farouk and Rita Hayworth will have nothing on the owners of the new Nash. Joe Doakes, too, can have a car which Pinin Farina has helped design

DETROIT

PININ FARINA—the prolific custom body designer who turned out cars for King Farouk and Rita Hayworth—has a hand in the design of the new 50th-anniversary Nash.

That fact will probably make little impression on the average car buyer, but the appearance of the new model will, according to dealers and newsmen who have examined it. The enormous expenditure involved in the complete design of the body will amply pay off, they believe.

High Tooling Cost—George W. Mason, Nash-Kelvinator Corp. president and chairman, sets the tool and die cost for the new model at $16 million. Cost for the absolutely new Rambler when it first appeared was pegged at $13 million.

Nash went all-out for its 50th-anniversary car. It realized that in the last several years it had acquired a reputation for stodginess in its regular-size cars, although the Rambler, Nash-Healey and experimental N.X.I. were proof that conservation did not have the upper-hand. The Statesman and Ambassador, however, lacked verve and flair. So the decision was made that it would have to take steps or the third oldest automobile manufacturer would be in trouble.

Incorporation — Pinin Farina probably will get more of the credit for the sleek lines and distinctive over-all appearance of the car than he deserves. Features from all the other Nash vehicles have been incorporated in the new package. One of the most unusual of those is the embossed ribbing in the door and rear panels directly below the windows. In the N.X.I. that same effect was emphasized more strongly, took the form of a depression at a convenient height for elbow resting. From the Nash Rambler came a number of features, including the new front suspension and the reverse angle of the side window pillars. From the N.X.I. and the Nash-Healey a uniquely shaped windshield was evolved. Nash-Healey influence is again noted in the low set of the hood between the high front fenders.

Nash engineers resisted a strong impulse to restyle the grille in conformity with that almost universally adopted by other car makers who have lumped grille and bumper into a unit. Some people may continue to liken the head-on view of the Nash to a whale charging a school of fish with mouth agape, but the separate radiator and grille concept won out. In explaining the decision, one engineer said the two units have entirely separate functions and a melding of the two robs both of some of their effectiveness.

Good Look—In the over-all design a premium was put on good visibility in all directions. In the four-door model the increase in glass area over last year's model is 25 per cent. Rear window is of three-section design curving around a la hard-top style.

Because of unusual configuration of the rear post joining top and body, a usual blind spot in over-the-shoulder vision is effectively minimized.

Another departure from convention is its adoption of aluminum extrusions as inside and outside

frames for the side windows. Pioneered in the Rambler convertible and station wagon, these perform several functions. Satin-finished and ribbed they add brightness where other car makers use chrome. They are considerably narrower than the conventional frame giving higher and wider vision in the same size window opening.

They can readily be replaced in case of damage, they lighten the weight of the door assembly and insure a snug fit. In the opinion of Nash engineers, this construction feature ultimately will be adopted as a feature by all car makers.

New in the Front—A new type front-end suspension, built after principles incorporated in the Rambler and possible only by virtue of the unitized body construction, makes use of a longer than usual coil spring mounted to the underside of the fender in a reverse well. Directly over and at the same angle as the steering knuckle, that absorbs direct vertical loads. At the same time unsprung weight is substantially reduced by eliminating or slimming down members normally required for spring mounting.

Door handles are unique, they work by squeezing, the movable portion being underneath and incorporated in the handle. Part of the housing of the right rear tail-light is hinged to swing upward revealing the gas tank filler tube.

Inside Job—The inside of the car has undergone as much of a change as the outside. A vinyl covered crash pad embodying ensolite, an energy-absorbing material, extends the width of the instrument panel. Twin radio speakers at the extreme ends of the dash allow good hearing even at fast speeds.

The front and rear seats use the new L. A. Young flock-coated coil spring system. Front reclining seat and convertible twin beds are optional equipment. The entire passenger compartment has been moved forward relative to the wheels, permitting expansion of the compartment both in length and width.

The new Ambassador has a six-cylinder overhead valve engine of 5 point higher horsepower than last years 115, the result of increasing the bore size to 3½ inches, displacement going to 252.6 cubic inches. A horizontal carburetor mounted alongside the engine replaces the downdraft carburetor formerly used. The Statesman, powered by an L-head six now with 88 horsepower achieves the three-point boost by an increase to 4½ inches of the stroke. Displacement becomes 195.6 cubic inches. Dual-range Hydra-Matic is optional equipment for all models as is automatic overdrive.

Originally offered in two-door and four-door models a custom hard-top convertible is later to be added to the line.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	461,294*	658,918
March	.....	802,737
April	.....	680,281
May	.....	695,898
June	.....	653,682
July	.....	522,858
August	.....	571,442
September	.....	505,758
October	.....	558,971
November	.....	480,199
December	.....	402,729
Total	.....	7,179,161

Week Ended	1952	1951
Feb. 16	111,821	178,141
Feb. 23	110,542	199,478
Mar. 1	118,397	177,567
Mar. 8	116,657	180,819
Mar. 15	110,000*	182,781

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

New Kaiser Makes Debut

Last of the parade of new models (excepting the small Hudson due this summer) is the Kaiser, the first edition of which came out earlier sporting an outside rear-mounted spare tire.

Its identifying features are a "bumper bridge" on the front and rear and a truly massive end piece on the rear bumper to unify it with the rub rail and balance the new tail-light protuberance. The front bridge substitutes for the horizontal grille bar while acting as the guard for both the grille and bumper. The rear bridge is designed to protect the rear body panel by making it virtually impossible for another car to override the bumper.

K-F stylists again exercise their penchant for color in the standard models and go whole-hog in their show cars. This year's piece de resistance is the "Sun Goddess'" using a plastic fabric with the appearance of bamboo splits and upholstery and floor covering material which looks like grass. This particular car is a hard-top convertible.

Mechanically the new Kaiser has undergone change in the front suspension, the torsion bar sway eliminator being welded to the lower suspension arm. Rear semi-elliptical springs have full length liners and covers.

A "follow-through' ignition system and improvements in the fuel pump and fuel line are designed, respectively, for better cold weather starting and elimination of vapor lock in hot weather. To accommodate the new dual-range Hydra-Matic a rear axle ratio of 3.31 to 1 is available.

Now that parts business is starting to mount from the early model Kaiser, president Edgar Kaiser believes he has every reason for optimism over the future of the company. Strengthening the dealer organization will be long-term, all-important activity.

Henry J. Kaiser shares his son's optimism but on a broader scope. Both are convinced that the major problem confronting car makers is over the severity of credit controls, that these are more important than materials restrictions. Edgar Kaiser anticipates a 40 per cent increase in K-F's car-making schedules, beginning in mid-second quarter, to bring its operation up to quota.

Autonomy for Lincoln, Mercury?

Shake-up in the Lincoln-Mercury Division of Ford appears to insiders as an important first move toward giving greater autonomy to each of those cars. Three new departments have been established in the division—Mercury sales, Lincoln sales and sales training, none of whose managers have yet been named. All staff departments of the general sales office have also been divided into two functional groupings.

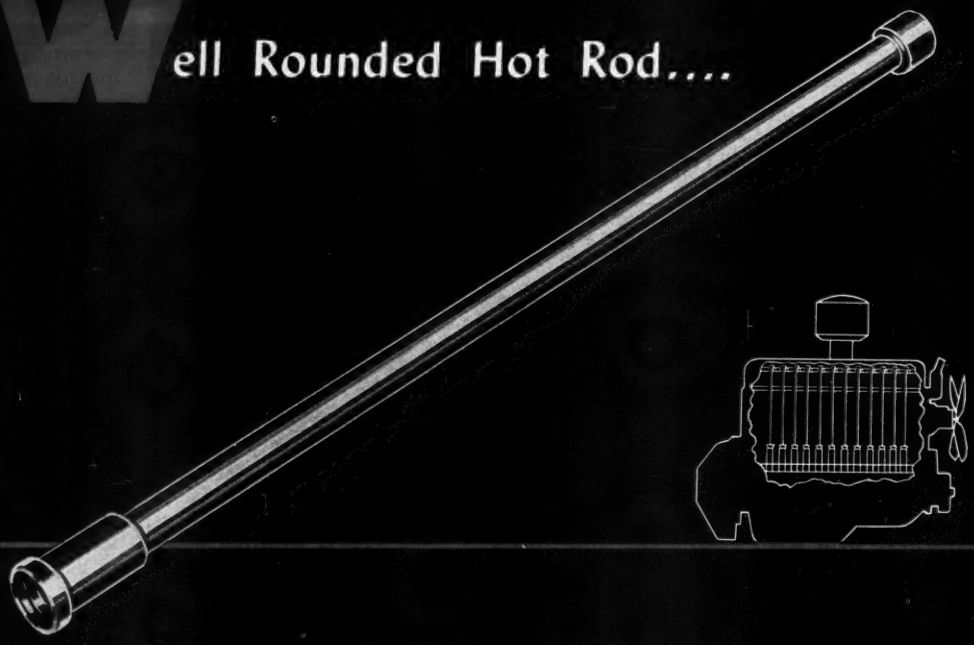
NEW PRODUCT DESIGNS DEMAND NEW MACHINING METHODS

This New Britain Automatic developed for contour facing jet compressor wheels

AUTOMATIC BAR AND CHUCKING MACHINES • PRECISION BORING MACHINES
LUCAS HORIZONTAL BORING, DRILLING AND MILLING MACHINES

NEW BRITAIN
Automatics
THE NEW BRITAIN GRIDLEY MACHINE DIVISION
THE NEW BRITAIN MACHINE COMPANY
NEW BRITAIN, CONNECTICUT

Well Rounded Hot Rod....



SHARON* SPECIALLY FINISHED STEEL IMPROVES VALVE PUSH ROD STEM

One important manufacturer in the automotive industry was encountering difficulty in the fabrication of the hollow stemmed valve push rod. The narrow strip steel resisted efforts to form it into the required round.

Sharon Steel engineers solved the problem without changing the methods or the machinery. They discovered the steel tended to slip during forming. By a special process they were able to dull the finish of the steel enough to stop the slipping and cure the ailment.

Sharon engineers are constantly in the field working with manufacturers in a continuous effort to produce better steel products at lower costs.

*Specialists in **STAINLESS, ALLOY, COLD ROLLED and COATED** Strip Steels.

SHARON STEEL CORPORATION

Sharon, Pennsylvania

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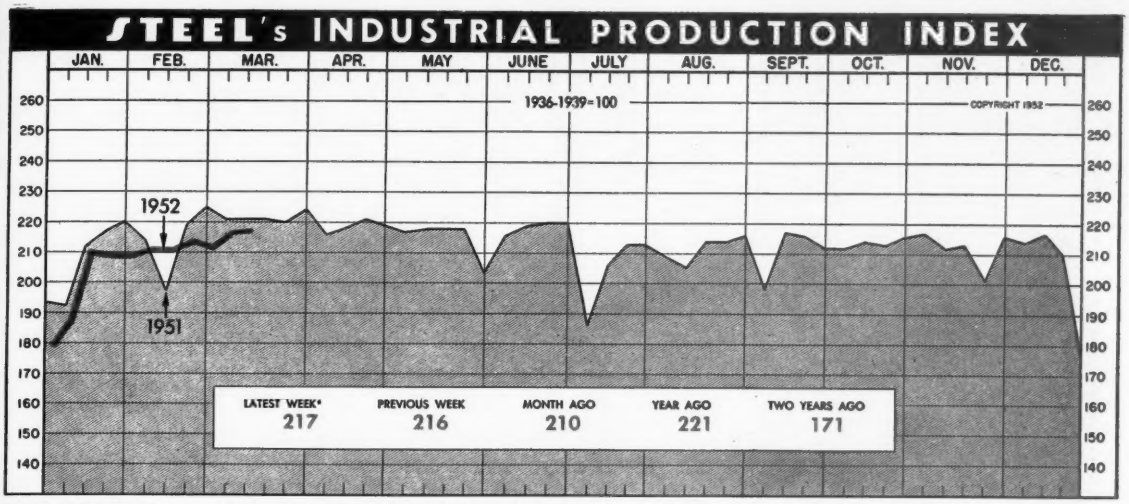
For information on Titanium contact Mallory-Sharon Titanium Corp., Niles, Ohio

SHARONSTEEL


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1936-1939=100
COPYRIGHT 1952
260 250 240 230 220 210 200 190 180 170 160 150 140
1952
1951
LATEST WEEK* 217
PREVIOUS WEEK 216
MONTH AGO 210
YEAR AGO 221
TWO YEARS AGO 171

* Week ended Mar. 8. Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Revival of construction activity may herald spring pickup in civilian goods manufacture, but the rail strike altered many production schedules temporarily

EARLY SIGN of a spring pickup in civilian goods manufacture might well be recent increases in new construction awards.

Particularly encouraging is the news that private housing awards are running 20 per cent ahead of last year's pace. In four consecutive weeks private housing has led all other construction categories in amount of contract dollars awarded. In the week ended Mar. 1, *Engineering News-Record* reports private housing volume at $68.3 million—highest since mid-January. Ten-week cumulative total was $515.4 million.

Plans for Future — While new construction spending in February dipped about 7 per cent to $2 billion, private construction fell less than usual for this time of year. Volume in this category—$1.4 billion — reflects primarily the strength in residential building as well as the rise in industrial work, concludes the Commerce Department. The buoy in February residential building was the 10 per cent increase in January starts.

Easing of inventory restrictions on builders and softening of controls over housing, commercial building, highways and school projects goes beyond the construction field. As contractors roll up their sleeves to take on more nonessential work, the market potential of other civilian industries increases too. Now that materials will be more abundant, odds favor a creeping increase in production and employment in those lines.

Rail Strike Woes—Undermining the determined bid by basic industry to raise output was the Midwest railroad strike. Idleness there fanned out quickly to industry and was reflected in many altered work schedules. In the week ended Mar. 8—before the strike got under way —STEEL's industrial production index registered 217 per cent of the 1936-1939 average. Latest index reading is up 1 point from the week before when a 5-point spurt was recorded.

Shattered Again . . .

With news of increased materials allotments and talk in the air of more decontrols coming, steelmakers last week set their sights on another new production mark. American Iron & Steel Institute estimated steel production in the week ended Mar. 15 shattered the all-time high set just the week before. Yield was calculated to be 2,114,000 tons of ingots and steel for castings.

Green Light for Autos . . .

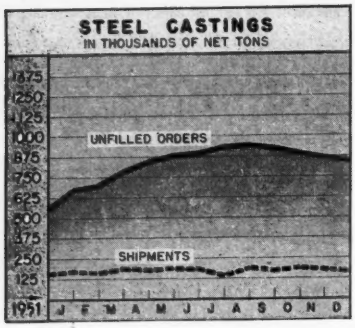
Automakers apparently have been flashed a green light from Washington to dip into second-quarter allotments for March production. So says *Ward's Automotive Reports*, which finds hard and fast restrictions on allocations for specific quarters may disappear.

Reason for dipping into the next quarter stockpile may be to get up production steam gradually. Output slipped badly when first-quarter restrictions went into effect, and is only now recovering. Materials allotted now will build 1,050,000 passenger cars in the second quarter instead of the 930,000 originally planned.

More than 365,000 cars will roll off the assembly lines this month, *Ward's* predicts. That would be the highest total since October. In the week ended Mar. 8, U. S. and Canadian manufacturers turned out 116,657 autos and trucks, a customary start-of-month drop of 1740 units from the previous week.

Mid-Winter Lows . . .

Employment continued at mid-winter lows in February, and was

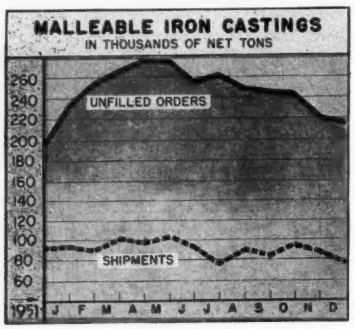


Steel Castings

Thousands of Net Tons

	Shipments 1951	Shipments 1950	Unfilled Orders* 1951	Unfilled Orders* 1950
Jan.	174.1	89.1	675.4	142.5
Feb.	164.0	91.8	707.4	165.2
Mar.	190.7	111.8	779.7	185.6
Apr.	181.9	107.0	846.9	201.6
May	189.2	117.9	851.7	198.0
June	184.7	131.1	895.1	206.8
July	147.2	98.3	930.0	255.4
Aug.	177.1	128.4	944.2	239.9
Sept.	160.7	134.6	918.0	428.0
Oct.	189.9	149.6	891.5	521.8
Nov.	176.7	145.9	865.0	537.7
Dec.	165.1	155.3	846.4	554.2
Total	2,093.3	1,460.8		

* For sale. U. S. Bureau of the Census.

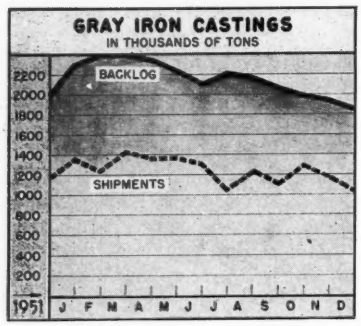


Malleable Iron Castings

Thousands of Net Tons

	Shipments 1951	Shipments 1950	Unfilled Orders* 1951	Unfilled Orders* 1950
Jan.	92.5	62.9	234	62
Feb.	89.0	60.4	255	67
Mar.	101.7	66.3	267	70
Apr.	97.3	69.8	276	76
May	100.8	76.2	275	77
June	93.7	82.3	256	87
July	76.8	67.5	263	105
Aug.	90.7	86.0	249	132
Sept.	82.3	82.5	245	153
Oct.	93.9	90.0	238	160
Nov.	88.2	85.2	221	180
Dec.	76.0	91.5	215	195
Total	1,082.9	920.6	...	...

* For sale. U. S. Bureau of the Census.

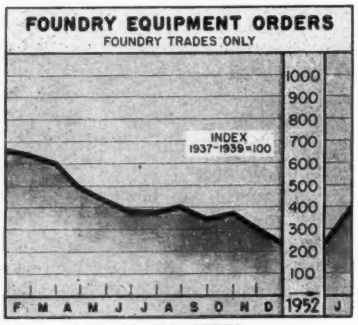


Gray Iron Castings

Thousands of Net Tons

	Shipments 1951	Shipments 1950	Backlogs* 1951	Backlogs* 1950
Jan.	1,364	913	2,298	914
Feb.	1,234	864	2,392	873
Mar.	1,440	996	2,390	922
Apr.	1,363	981	2,337	922
May	1,396	1,095	2,229	978
June	1,309	1,136	2,162	1,040
July	1,029	961	2,208	1,287
Aug.	1,219	1,202	2,145	1,670
Sept.	1,115	1,159	2,055	1,794
Oct.	1,302	1,255	1,983	1,840
Nov.	1,184	1,161	1,934	1,930
Dec.	1,032	1,182	1,847	2,012
Total	13,768	12,905		

*For sale. U. S. Bureau of the Census.



Foundry Equipment Orders

	Index 1952	Index 1951	Value in Thousands 1952	Value in Thousands 1951
Jan.	404.5	668.0	$1,862	$3,075
Feb.	....	638.6	....	2,940
Mar.	....	599.0	....	2,758
Apr.	....	490.1	....	2,256
May	....	431.7	....	1,987
June	....	393.2	....	1,810
July	....	390.3	....	1,797
Aug.	....	404.5	....	1,862
Sept.	....	346.5	....	1,595
Oct.	....	372.4	....	1,714
Nov.	....	305.5	....	1,406
Dec.	....	230.5	....	1,061

Foundry Equipment Mfrs. Assoc.

Charts—Copyright 1952, STEEL

Issue Dates of other FACTS and FIGURES Published by STEEL:

Construction Feb.11	Ironers Jan.21	Ranges, Gas Feb.25
Durable Goods Mar.3	Indus. Production...Feb.18	Refrigerators Feb.25
Employ., Metalwkg. Mar.10	Machine Tools Mar.10	Steel Forgings Feb.25
Employ., Steel Jan.28	Prices Feb.18	Steel Shipments Dec.17
Fab. Struc. Steel ..Mar.10	Pumps Mar.3	Vacuum Cleaners ..Feb.4
Freight Cars Mar.10	Purchasing Power..Mar.3	Wages, Metalwkg. ..Jan.28
Furnace, Indus. ...Feb.18	Radio, TV Jan.21	Washers Mar.3
Gear Sales Feb.11	Ranges, Elec. Feb.25	Water Heaters Feb.11

roughly 3 million below the 1951 summer peak, says the Commerce Department. Total employment was estimated at 59,752,000; nonfarm employment at 53,688,000 was slightly above a year ago and about 3 million above February, 1950.

Only 3.4 per cent of the civilian labor force was idle in February as unemployment remained substantially unchanged at 2,086,000. Two years ago, when unemployment hit a peak, about 7.6 per cent of all civilian workers were unemployed.

Hired and Fired...

Factory hirings rose from 30 to 45 per 1000 employees in January. That gain, says the Labor Department, indicates a pre-Easter expansion in many consumer goods plants as well as the greater number of working days in January. Hiring was about 15 per cent below the January, 1951, rate. Layoffs were unchanged in the month at 14 per 1000 employees; that's about 40 per cent greater than a year ago. Quit rate rose seasonally in January to 19 per 1000 employees; it was 10 per cent lower than in the same month last year.

Payroll Peak...

Another new high for the iron and steel industry: Its payroll in January, $252,236,000, was $5.5 million over December. Payments to wage earners averaged $1.958 in January, 2.5 cents over the same month a year ago. Total employment increased 14,900 in the year to 672,100, but wage earners worked 41.4 hours a week in January, 0.2 hours less than one year earlier.

Personal Income Off...

Drops in corporate dividend payments and farm income showed up in January personal income totals. Annual rate of personal income, at $257 billion, was $1 billion lower than in the previous month, reports the Office of Business Economics.

Private-industry wage and salary disbursements were unchanged at an annual rate of $144 billion but government payrolls increased

to a $31.7 billion annual rate. Payroll changes in most major industries during the month were small. Dividend receipts dropped from the high annual rate of $10 billion in December to $8.5 billion in January. Self-employed persons brought into Old Age and Survivors Insurance coverage kicked in initial payments at an estimated $400 million annual rate which also accounted for reduction in personal income flow.

Savings of individuals so far this year average more than 20 per cent higher than at this time last year. The annual savings rate is estimated at $20.5 billion.

Retailers Worried . . .

Retailers are worried about their customers holding on to their dollars with the Ides of March at hand and Easter coming late this year. Despite severe price slashes, department and furniture store sales in January were 13 per cent below the year-ago level, says the Commerce Department. They were little better in February or early March either.

Household appliance store sales in January dropped 28 per cent under January, 1951. Sales of wholesalers during January were down 15 per cent; chain store and mail order houses recorded about 3 per cent lower volume that month.

One move supported by those who want customers is a general easing of restrictions on consumer credit. Consumer installment credit outstanding dipped seasonally by $193 million during January. Total at month end was $13,313 million, a little above the year-ago level. Charge account balances outstanding slipped $374 million. Total consumer credit outstanding was $20,080 million going into February, $560 million below the previous month-end, but $143 million above a year ago.

Trends Fore and Aft . . .

Manufacturers' sales and new orders increased in January, while inventories and backlogs showed little change . . . Freight car builders delivered 7358 new cars in February, 1284 less than in January . . . TV broadcasting brought in more revenue to the networks than AM radio operation last year. Of 106 TV stations, 93 finished the year in the black . . . New pump orders in January totaled $5.5 million . . . Tax load on individuals has increased by about two-thirds since Korea . . . Business inventories at the end of January totaled $69.8 billion. Total book value remained near Dec. 31 levels.

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	101.5	101.0	101.0
Electric Power Distributed (million kwhr)	7,497	7,416	6,795
Bituminous Coal Output (daily av.—1000 tons)	1,715	1,679	1,894
Petroleum Production (daily av.—1000 bbl)	6,360[1]	6,367	6,047
Construction Volume (ENR—millions)	$296.6	$165.7	$258.9
Automobile, Truck Output (Ward's—units)	116,657	118,397	180,819
TRADE			
Freight Car Loadings (unit—1000 cars)	740[1]	756	750
Business Failures (Dun & Bradstreet, number)	170	163	153
Currency in Circulation (millions)[3]	$28,464	$28,390	$27,219
Dept. Store Sales (changes from year ago)[3]	−15%	−12%	+20%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$16,892	$14,767	$17,202
Federal Gross Debt (billions)	$260.3	$260.3	$255.7
Bond Volume, NYSE (millions)	$14.5	$11.0	$20.1
Stocks Sales, NYSE (thousands of shares)	7,263	6,158	8 567
Loans and Investments (billions)[4]	$73.5	$73.5	$69.5
United States Gov't. Obligations Held (billions)[4]	$31.9	$32.0	$30.8
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92[1]	171.92[1]	171.92
STEEL's Nonferrous Metal Price Index[6]	243.6	243.6	248.4
All Commodities[7]	111.4	111.7	115.0
All Commodities Other Than Farm and Foods[7]	112.4	112.7	116.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

SAVE STOCKROOM TIME

Requisitions to your stockroom for Pheoll Fasteners can be filled in less time. Boxes, kegs and packages are plainly marked with sizes clearly indicated for rapid identification. Pheoll's quality products handle easily, can be quickly counted or transferred to bins or assembly line trucks.

REDUCE ASSEMBLY TIME

Workmen gain time assembling with Pheoll screws, bolts, and nuts because they are accurately threaded, drive easily, seat rapidly, grip tighter—assuring stronger assemblies, easier inspection and less rejects.

IMPROVE YOUR PRODUCT APPEARANCE

The uniform quality of Pheoll Fasteners improves your product appearance. Precision slotted and finished heads, cleanly chamfered nuts, prevent marred surfaces and add to your product's sales appeal. Write for Pheoll literature and price list.

Save Costs... Increase Profits with these Pheoll Fasteners

ASK ABOUT PHEOLL Machine Screws† Machine Bolts Special Screws and Bolts Cap Screws Machine Screw Nuts Wood Screws† Thumb Screws Brass Washers Stove Bolts†

†Furnished in slotted and Phillips Recessed Head Types

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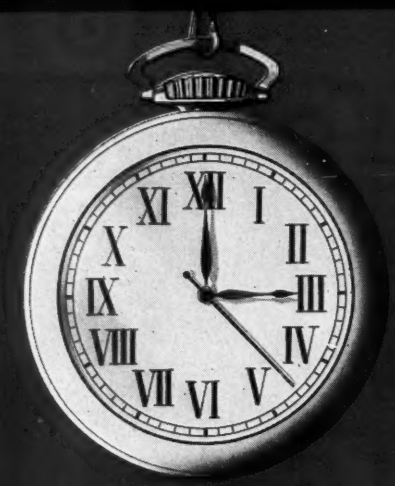
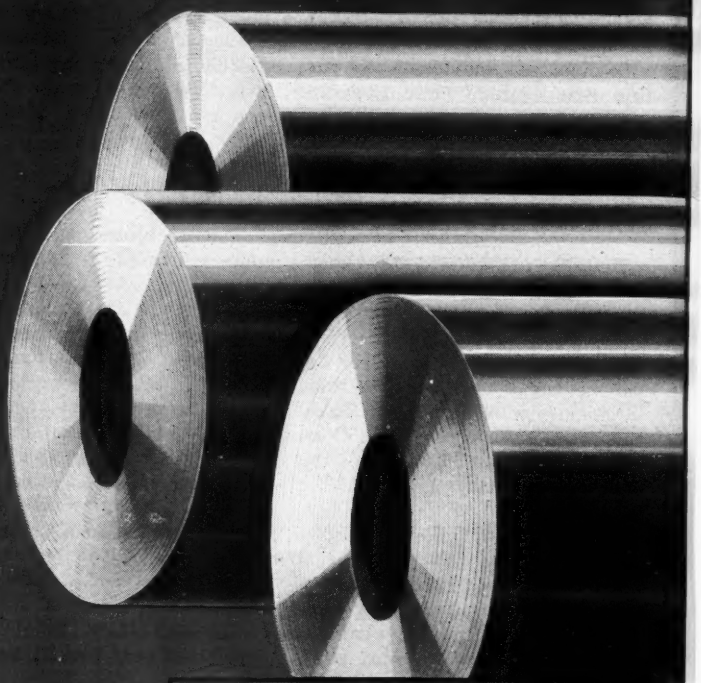
Industrial Fasteners and Holding Devices



by the hour...



and by the ton

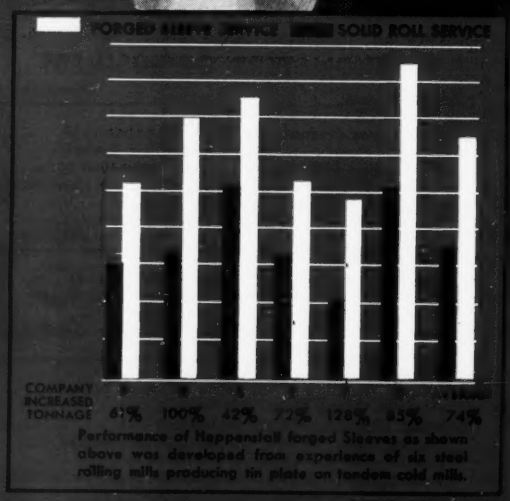
Heppenstall back-up roll Sleeves make good production sense

Heppenstall Sleeves for Back-Up Rolls keep the mill line running longer because they're built to last. They mean less down-time—increased productivity—lower overall costs. Their records of performance make good production sense.

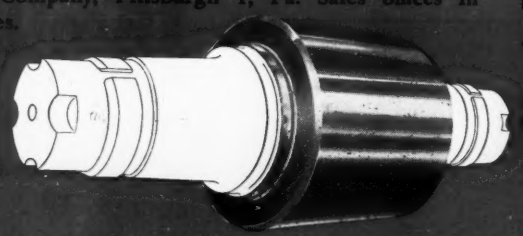
Examine the records of six different steel rolling mills, for example. The records show increases in productivity of from 61% to 128% in terms of roll service. These are typical cases. There are many others showing equal benefits in time and cost savings—increases in production.

And, there's plenty of "reason why" Heppenstall Sleeves provide this exceptional service. Each sleeve is forged from Heppenstall's own alloy steel and "custom-built" . . . normalized, annealed, heat treated, and tempered to exact specifications. The results: correct hardness . . . maximum density . . . perfect fit . . . durable surfaces . . . resistance to cracking and spalling in high speed service.

For complete information and technical assistance, call Heppenstall Company, Pittsburgh 1, Pa. Sales offices in principal cities.



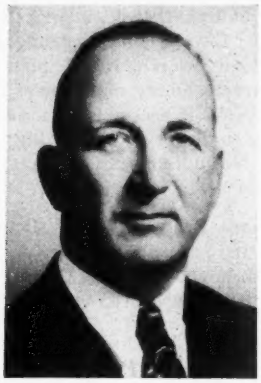
Performance of Heppenstall forged Sleeves as shown above was developed from experience of six steel rolling mills producing tin plate on tandem cold mills.



Heppenstall

—the most dependable name in forging!

Men of Industry



C. K. HOOD
. . . new V. P. at Worthington Pump

Z. R. WILLIAMS
. . . V. P.-works mgr., Portable Electric Tools

A. RASMUSSEN
. . . Fahralloy V. P.-plant mgr.

C. K. Hood was elected a vice president of **Worthington Pump & Machinery Corp.**, Harrison, N. J. and will be responsible for direction of activities of the public works, steam power, deaerating, water treating, and steam turbine divisions. He will report to T. Cruthers, vice president. **W. J. Van Vleck,** manager, Atlanta district sales office, succeeds Mr. Hood as manager, New York district sales office. **C. W. Kramer** becomes manager of the Atlanta office, and **I. W. Leggett** of the Charlotte, Va., branch office.

E. R. O'Brien, formerly office manager, was appointed sales manager, **Edgcomb Steel of New England Inc.,** Milford, Conn. **A. W. Moody** continues as vice president-sales. **R. E. Evasick** was appointed office manager and **A. E. Pikul,** assistant office manager.

Paul R. Turner was promoted from eastern regional manager to director of sales, Electro-Motive Division, **General Motors Corp.,** at La Grange, Ill. He succeeds **Nelson C. Dezendorf,** made general manager, Electro-Motive Division. Mr. Turner has been with the division since its inception in Cleveland in 1922, resigning from White Motor Truck Co. to become associated with H. L. Hamilton in the founding of Electro-Motive Engineering.

E. E. Ensign, until recently metallurgist at Ford Motor Co., joined the staff of **A. R. D. Corp.,** New York, as vice president.

Z. R. Williams was appointed vice president and works manager, **Portable Electric Tools Inc.,** Chicago. He has been with the company since 1946.

George A. Bentley was appointed sales manager, stamping division, **Detroit Stamping Co.,** Detroit.

L. B. Littrell was appointed production manager, **Pacific Airmotive Corp.,** Burbank, Calif., succeeding **Luther Harris,** vice president-production division. Mr. Harris resigned to take over the executive vice presidency of Aircraft Engine & Parts Corp., with headquarters in New York.

James E. Humphreys, manager of the Twinfuel division of **Norman Products Co.,** Columbus, O., has also been placed in charge of advertising and sales promotion for the entire line of conversion burners, furnaces and overhead heaters.

H. O. Fullam was named chief industrial engineer in charge of methods engineering, tool engineering, tool manufacturing and maintenance of plant equipment at the **C. H. Wheeler Mfg. Co.,** Philadelphia. He was shop superintendent of G. A. Gray Co., Cincinnati, prior to joining Wheeler.

Granite City Steel Co., Granite City, Ill., appointed **Lyle F. Gulley** director of purchases.

Frank Wright was appointed production manager of **Ford Motor Co.'s** Buffalo stamping plant.

A. Rasmussen, former sales manager, was elected vice president and plant manager, **Fahralloy Co.,** Harvey, Ill. **Robert E. Kroc,** former assistant sales manager, becomes sales manager.

Malcolm D. Shaffner was appointed executive vice president, **Saco-Lowell Shops,** Boston. He formerly was vice president, treasurer and secretary of the company, and has been with the textile machinery manufacturing concern since 1933. He remains as treasurer and a director. Mr. Shaffner is also president of the subsidiary, Pawtucket Spinning Ring Co. **Robert M. Jones** was appointed vice president-research and development, and **F. Gorham Brigham Jr.** as secretary.

Henry Harnischfeger was elected to the new position of executive vice president, **Harnischfeger Corp.,** Milwaukee.

Joseph Proske, retired from the Ordnance Department, U. S. Army, after 41 years of service, is now associated with **Burgess-Norton Mfg. Co.,** Geneva, Ill., in an engineering capacity.

William F. Skeer Jr., previously West Coast sales, was appointed district manager of the Pittsburgh area for **Exothermic Alloys Sales & Service Inc.,** Chicago, to assist W. J. Taylor, vice president.

Mid-West Abrasive Co., Owosso, Mich., elected **R. J. Foresman** a director. He is general sales manager of the company. He fills the

vacancy on the board occasioned by the death of **Phil Huber. J. A. Kretzschmar** was elected assistant secretary and **V. O. Smith,** assistant treasurer. Mr. Kretzschmar continues to serve as purchasing agent.

Donald B. Stroud, sales engineer, **Reliance Electric & Engineering Co.,** Cleveland, for the last four years, attached to the Cincinnati district sales office, was transferred to Indianapolis.

Roscoe R. Thomas was promoted from assistant chief engineer to chief engineer, manufacturing division, Fairfield, Ala., **Tennessee Coal & Iron Division,** U. S. Steel Co. He succeeds **Rollin D. Osgood,** retired. Mr. Thomas' former position is filled by **J. W. McWilliams.**

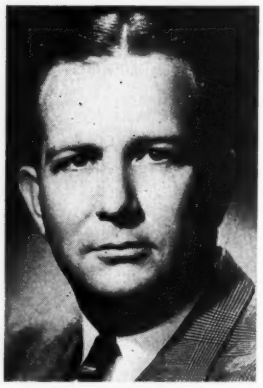
Leon D. Urbain will head the factory and industrial division of **Consoer, Townsend & Associates,** Chicago.

H. J. Hagn was elected president and a director, **Chiksan Co.,** Brea, Calif. **W. Edgar Spear,** former president, becomes chairman of the board. **J. H. Robinson** was elected a vice president of Chiksan and general manager of Well Equipment Mfg. Corp., a division.

David F. Devine resigned as comptroller, Bell Aircraft Corp., to become vice president of the financial division of **Arma Corp.** in Brooklyn, N. Y., and Mineola, L. I.

J. R. Weaver, vice president-defense and special products division —Eddystone, **Baldwin-Lima-Hamilton Corp.,** Philadelphia, resigned to accept a position on the staff of the recently appointed vice president-manufacturing of Westinghouse Electric Corp. **Walter A. Rentschler** was appointed vice president in charge of the Eddystone Division. He was previously vice president, Lima-Hamilton Division, and continues in charge of the Hamilton plant, which will come under immediate supervision of **J. F. Connaughton,** appointed general manager of the plant. The Lima division continues under the direction of **H. F. Barnhart,** who will report to the president. **Alex Smith** was appointed manager of a newly created export sales department, and **C. A. Campbell** is assistant manager.

WILLIAM A. BURNS JR.
. . . named president of Trailmobile



S. E. BIGGS
. . . Trailmobile V. P.-mfg.

William A. Burns Jr. was named president, **Trailmobile Inc.,** Cincinnati, a subsidiary of Pullman Inc. He has been vice president and general sales manager since 1950, and succeeds **George M. Bunker. S. E. Biggs,** general manager-manufacturing, was named vice president manufacturing, and **James A. Nickerson,** assistant comptroller and credit manager, was promoted to vice president in charge of credits.

Minnesota Mining & Mfg. Co., St. Paul, appointed **G. G. Willson** manager of the technical service section of the 3M coated abrasives laboratory.

Donn D. Greenshields was elected a director of **National Screw & Mfg. Co.,** Cleveland. He has been vice president since 1949.

Kenneth M. Morse was appointed industrial hygienist, **United States Steel Co.,** Pittsburgh. He was with the American Foundrymen's Society in Chicago, where he was director of safety in hygiene and air pollution program.

Appointments in **General Electric Co.'s** meter and instrument department at Lynn, Mass., include: **Donald E. Craig,** named manager of the Somersworth, N. H., plant; **J. C. Garrett,** acting manager of marketing; **L. P. Hannaway,** assistant to the manager of marketing; and **J. E. McQuillan,** manager, marketing services.

Michiana Products Corp., Michigan City, Ind., appointed **Harry A. Porter Jr.** in charge of its Chicago office. He succeeds **J. H. Staiger.**

James M. Walton was appointed plant industrial engineer, Midland Works, **Crucible Steel Co. of America,** Midland, Pa. For the last 12 years he was with the Homestead district works of U. S. Steel Co.

James L. Everett was appointed administrative assistant to the general manager of **Dravo Corp.'s** engineering works division. He previously served in the same capacity with that division's contract manager.

Officers of the recently formed **Rich & Proctor Steel Co.** which opened a warehouse at Oakland, Calif., include: **Gustav R. Rich,** president; **Edwin E. Proctor,** vice president; and **Sigmund T. Rich,** secretary and treasurer. Gustav and Sigmund Rich are also president and vice president, respectively of Rich Steel Co. and Rich Steel Pickling Co., Los Angeles.

Charles A. Bennett, general manager of the Buffalo branch of **Brace-Mueller-Huntley Inc.,** was elected vice president of the steel warehouse concern.

Paul A. Hilton, former controller and assistant general manager, Crosley Distributing Corp., New York, was appointed controller, **Audio & Video Products Corp.,** New York.

George E. Clifford, formerly a vice president, National Supply Co., in charge of sales for the Spang-Chalfant Division, was named vice president, **Kittanning Refractories Inc.,** Pittsburgh.

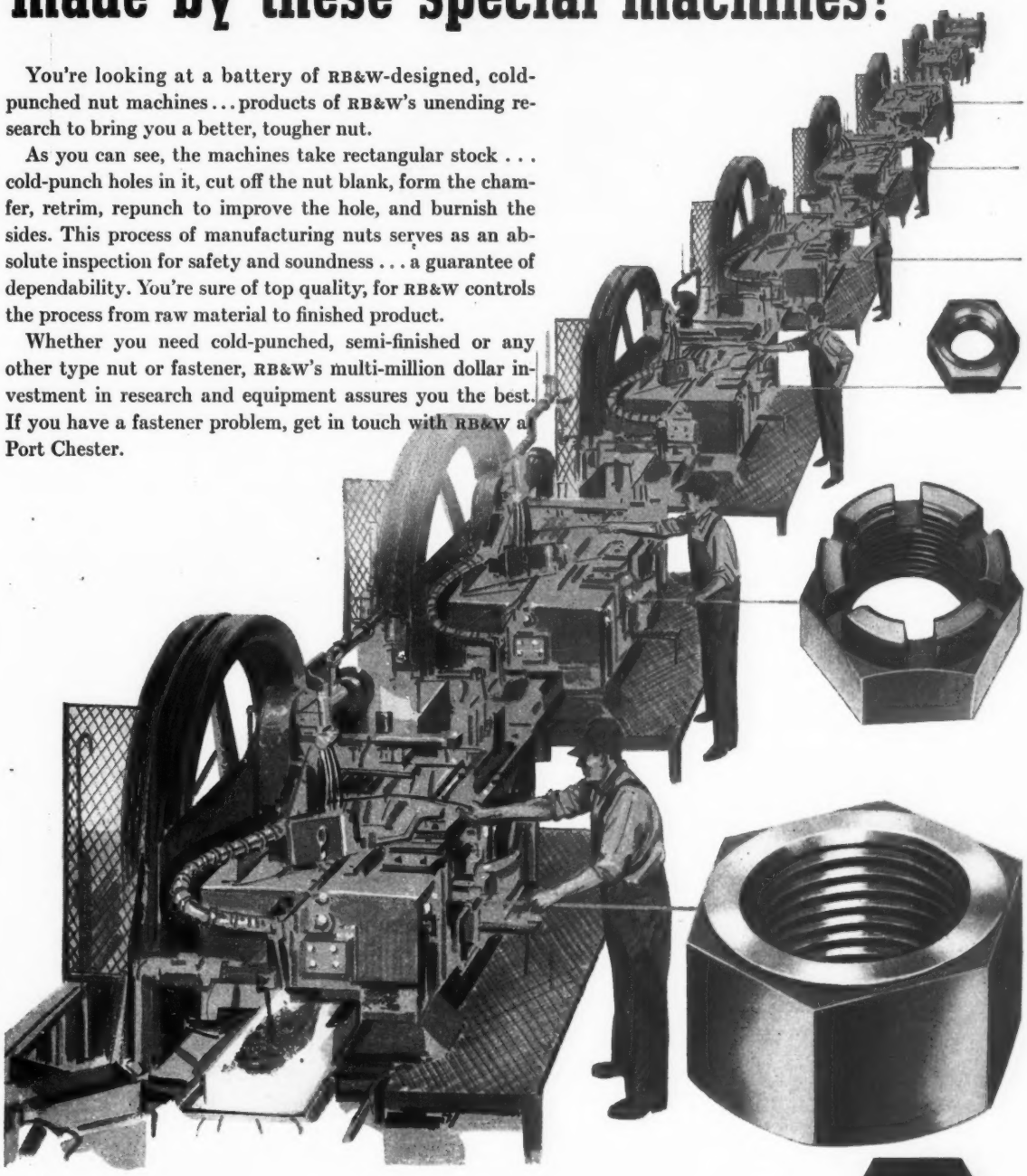
Gosta Almstedt was appointed eastern district manager, and **Frank J. Satter,** assistant district

Get safer, stronger assembly with nuts made by these special machines!

You're looking at a battery of RB&W-designed, cold-punched nut machines... products of RB&W's unending research to bring you a better, tougher nut.

As you can see, the machines take rectangular stock . . . cold-punch holes in it, cut off the nut blank, form the chamfer, retrim, repunch to improve the hole, and burnish the sides. This process of manufacturing nuts serves as an absolute inspection for safety and soundness . . . a guarantee of dependability. You're sure of top quality, for RB&W controls the process from raw material to finished product.

Whether you need cold-punched, semi-finished or any other type nut or fastener, RB&W's multi-million dollar investment in research and equipment assures you the best. If you have a fastener problem, get in touch with RB&W at Port Chester.



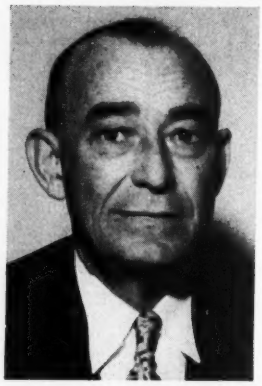
RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Plants at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Dallas, Oakland. Sales agents at: Portland, Seattle. Distributors from coast to coast.

RB&W
THE COMPLETE QUALITY LINE

107 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

PATRICK J. GLEASON
. . . gen. sales mgr., Tap & Drill E-Z



GEN. JOSEPH T. McNARNEY
. . . elected president of Convair

CLIFFORD R. MEYER
. . . V. P. sec'y, Morris Machine Tool

manager, **Sandvik Steel Inc.**, New York.

Patrick J. Gleason was appointed general sales manager, **Tap & Drill E-Z Corp.**, El Segundo, Calif.

Arthur H. Smock was appointed traffic manager, **American Welding & Mfg. Co.**, Warren, O., to succeed **Arthur Gray**, who remains with the company in a consulting capacity.

A. C. Erlandson, formerly superintendent of the foundry division, **Pettibone Mulliken Corp.**, Chicago, became affiliated with Kensington Steel Co., Chicago, as sales engineer.

Raymond J. Lawn was appointed supervisor of synthetic coatings research, **Pittsburgh Coke & Chemical Co.**, Pittsburgh.

William M. Roecker was appointed manager of the Cleveland office, **General Controls Co.**

James R. Hughes was made district manager of the recently opened Denver office of **Sterling Electric Motors Inc.**

Gen. Joseph T. McNarney, ret., was elected president of **Consolidated Vultee Aircraft Corp.**, San Diego, Calif. He succeeds **LaMotte T. Cohu**, who was elected vice chairman of the board. Both officers assume their new positions Apr. 1.

George A. Coffey was appointed superintendent, foundry division, **American Radiator & Standard Sanitary Corp.'s** Bond plant, Buffalo.

James W. Ramsey was appointed assistant to general traffic manager, **American Steel & Wire Division**, Cleveland, U. S. Steel Co. Succeeding Mr. Ramsey as staff assistant to the president is **Richard Kimmel**, promoted from the sales statistics department.

Thomas H. West III, president of Draper Corp., Hopedale, Mass., was elected a director of **Brown & Sharpe Mfg. Co.**, Providence, R. I.

Raymond E. Hayes will head the Los Angeles office of **General Motors Corp.'s** department of public relations.

Clifford R. Meyer was appointed vice president and secretary, **Morris Machine Tool Co.**, Cincinnati. He has been with the company for the last four years as secretary.

Mangum Webb was elected vice president, **Chemical Construction Corp.**, New York, subsidiary of American Cyanamid Co. He has been sales manager since 1949.

W. E. Todd was appointed southern manager for the pre-engineered division of **Mechanical Handling Systems Inc.**, Detroit.

Curtis W. Van Allen resigned as assistant export manager, Stewart-Warner Corp., and became export manager, **Walker Mfg. Co.**, Racine, Wis.

Werner Orth and **Donald J. Waalkes** are newly named assistant engineers at **Allis-Chalmers Mfg. Co.**, Milwaukee. Mr. Orth is in the control section, Mr. Waalkes in the hydraulics section.

Cribben & Sexton Co., Chicago, elected **Sidney R. Hill** as treasurer. He continues as controller.

OBITUARIES . . .

Linus Krebs, 65, secretary-treasurer, **Federal Malleable Co.**, Milwaukee, died Mar. 6.

J. H. Young, associated with **Centre Foundry & Machine Co.**, Wheeling, W. Va., since 1904, and for many years president and general manager, died Feb. 23.

John P. Kelly, 75, a broker in new and used steel plant machinery in Buffalo, died Mar. 5. He previously was with **Bethlehem Steel Co.** and **Republic Steel Corp.** for many years as a civil engineer.

Charles B. Morehouse, 70, one time general superintendent, **New York Air Brake Co.** plant in Watertown, N. Y., died Feb. 27.

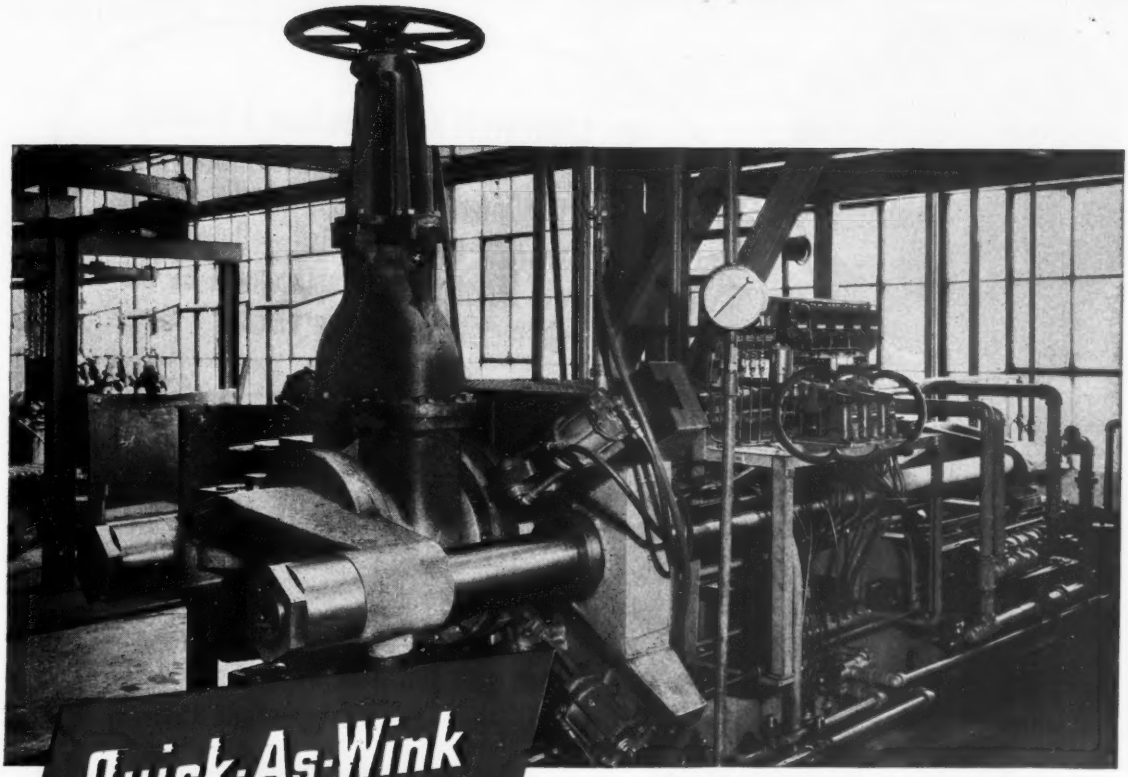
William F. Gerdes Sr., 78, president, **Michaelmann Steel Co.**, Quincy, Ill., died Mar. 8.

Roland R. Preston, 62, die sales engineer in the Pittsburgh office of **Carboloy Department**, General Electric Co., died Mar. 5.

Henry Weigand, 74, superintendent, **Olin Gas Engine Co.**, Buffalo, died Mar. 5.

Norman L. Dorn, 62, executive vice president, **Lane Wells Co.**, Los Angeles, died Mar. 2.

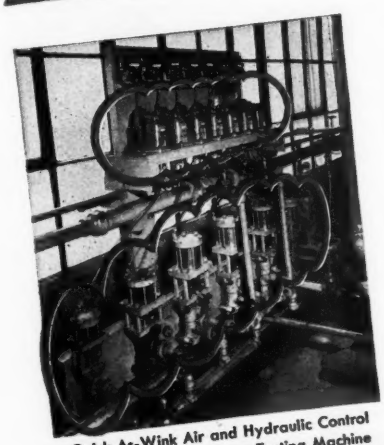
Alfred Dean, 68, business manager, **Erie Ornametal Iron Works**, Erie, Pa., died Mar. 3.



Special Built Machine for Exacting and Thorough Hydraulic Testing Heavy Duty Gate Valves

Quick-As-Wink Control Valves

industry wide recognition for unsurpassed dependability



Quick-As-Wink Air and Hydraulic Control Valves that Operate the Testing Machine Shown Above

We think steel men know most about steel; rubber industry men know most about rubber; machine builders know most about machines; and valve men know most about valves. So when a large nationally known valve manufacturer chose Quick-As-Wink control valves for the exacting and thorough testing of his own heavy duty valves (see photo) we're pleased — but not surprised, because throughout the steel, rubber, machine building, and most other industries, men with experience usually prefer Quick-As-Wink Control Valves. Positive and fast-acting, every valve is designed and built for maximum air economy and the long, dependable trouble-free service you want in your operations.

Quick-As-Wink
AIR AND HYDRAULIC
Control Valves

Hand, Foot, Cam, Diaphragm and Solenoid Operated

Mfd. by C. B. HUNT & SON, INC., 1911 East Pershing St., Salem, Ohio

Mr. STOREKEEPER—Do You have 3 Standard 85-Ampere mill Resistor Sections, each with 2 intermediate taps equally spaced between end terminals? Downtime will be short and replacement of the old resistors must be quick.
YOU BET!
We can give you TAB-WELD Resistors—
—they're ready for immediate use.
No shifting of tap plates required.
TAB WELD
PLATE RESISTOR

On-the-job connections easily made to any of the taps—small adjustments in resistance-value readily available.

Worth looking into . . . the resistor you can "use off the shelf."

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Production AND Engineering NEWS AT A GLANCE

ARTISTIC APPROACH—A World War II system of making composites of blueprints into one comprehensive picture of an airplane under construction is helping speed production. The combination of engineering and art enables mechanics and construction men to work swiftly and accurately after studying one drawing, instead of poring over hundreds. Using the isometric drawings in place of blueprints, mechanics can install equipment runs for wiring and tubing in about half the time previously required.

MORE CYCLES, MORE LIGHT—New fluorescent lighting system in which lamps operate on 360 rather than 60 cycles increases light available from lamps 40 per cent. Small capacitors replace heavier ballasts in the new method which may find application in industrial plants. The magnetic converter developed to step up frequency operates like a transformer stepping up voltage.

PROGRESSIVE DIES, FAST FEEDS—By combining mechanical feeding with progressive dies, many press operators are shoving production rates to dizzy heights. In one installation, a press with a two-station progressive die equipped with a 2-inch hitch feed operates unattended at 144 strokes per minute. Production is 7000 pieces per hour—representing an increase of about 300 per cent. p. 86

SLAG THREADS VS CORROSION—Fibrous structure of wrought iron is responsible for material's high corrosion resistance. A. M. Byers says tiny threads of glass-like silicate slag, distributed through the body of high-purity iron, halt and disperse corrosive attack and discourage pitting and penetration. Slag also anchors the initial protective scale which shields the underlying metal.

ELECTROLYTIC MACHINING—Difficult-to-machine metals can be given excellent finishes by an electrochemical dissolution process similar in principle to electropolishing. Electrolytic grinding uses high current densities reaching up to 1500 amp per sq in. Rate of stock removal is many times that obtained in other electrochemical processes. p. 84

NO NOISE VOLTAGES—An instrument cable free of spurious electrical signals caused by mechanical shock and vibration should be a boon to instrument makers. Signals, or "noise voltages" are a problem in many types of instrumentation where cables are subjected to mechanical forces. They interfere with measurements of pressure in underwater explosion and airblast research and with shock determinations in shock and vibration studies. One method for making noise-free cable commercially consists in extruding concentric layers of conductive rubber, nonconductive dielectric and more conductive rubber over a metallic conductor, stranded for flexibility.

GAS TO KWH TO ALUMINUM—Aluminum production capacity goal for 1952 is 2,200,000,000 pounds. Capacity for 1949 was 1,400,000,000 pounds. About 9 kwh of d-c power is needed to produce one pound of aluminum, so power demand is up about 800,000 kw. Since low-cost hydroelectric power is not available in sufficient amounts, natural gas is filling in. More than 350,000 kw of this additional capacity is provided by gas engines driving d-c generators.

MULTI-SPOT WELDED—Huge, specially-designed spot welding machines are being pressed into service in the aircraft-building program. One parts manufacturer fabricates external wing fuel tanks by rotating electrodes which produce overlapping spot welds, making the seams gas-tight. Complete sets of floor beams for cargo aircraft are spot welded, with 1000 welds in each I-beam assembly. p. 91

PAPER THERMOMETER—Thermal indicators made of paper give instant temperature readings from 115 to 500°F. The thermometer consists of white pigment coating on black paper. The coating can be designed to melt at any definite temperature when the white pigment melts into the paper base, leaving a black background. Temperature indicators based on color changes have been used industrially for several years, but they are not suitable for use by color blind persons. The black and white indicators have no such drawbacks.

SPEAKING OF CONSERVATION—By reclaiming silica gel, the Air Materiel Command recovers a six month supply for 55 per cent of the cost of the same amount of new silica gel. About 4,900,000 pounds recovered yearly saves about $698,000. Recovery technique also saves 1 million pounds of sulphuric acid used in making new silica gel but not required in the recovery process . . . Army Ordnance's Detroit Arsenal has a gear cutting machine which turns out a tank turret-ring gear in 30 minutes, compared to former time of 4½ hours, eliminates 90 per cent of the machine tools formerly required for this process, saves $400 per day for each machine in use . . . Navy Photo Center recovers $1000 worth of silver a month from photographically exhausted fixer by an electrolytic process, then rejuvenates the fixer to save another $1250 per month.

ELECTROLYTIC GRINDING:

Stubborn Alloys Less Formidable

Principle of removing stock by electrochemical action is applied successfully to the grinding of difficult-to-machine metals and metal carbides. Surface finish is excellent

METHOD of machining accurately metal alloys by removing stock electrochemically is a promising technique for machining the so-called unmachinable alloys. Still in its infancy, electrolytic grinding offers several advantages, especially in form grinding. There is no wear on the cathode wheel. Extraordinarily good finishes can be imparted to the metal surfaces. These finishes are independent of the cutting rate. Since the work piece in electrolytic grinding either does not touch the wheel at all or only slides against spacers imbedded in the wheel surface, grinding strains are eliminated.

In grinding single-point tungsten carbide lathe tools, electrolytic methods can be applied to off-hand grinding, with no change in the techniques used in conventional grinding. Electrolytic grinding will machine the steel shank simultaneously with the carbide insert, eliminating one operation. Current practice requires that the shank first be relieved by grinding with an aluminum oxide wheel before the carbide is ground with a diamond wheel.

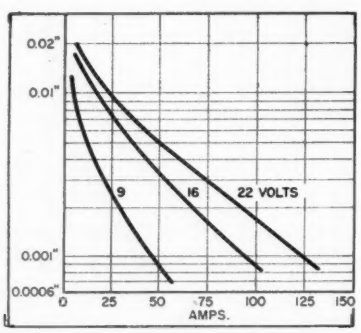


Fig. 1 — Relationship between gap-distance and current when plunge grinding ⅜-inch diameter hardened high speed steel (Rockwell 63C)

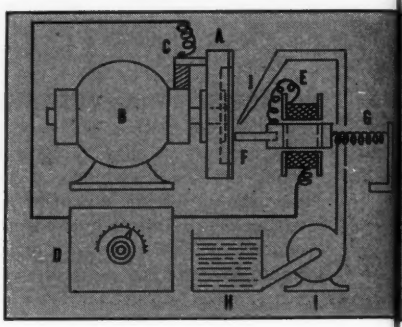
New Method, Old Idea—Dissolution of metals by means of electric current goes back to the 17th century, at which time the Italian professor Volta discovered that a metal anode goes into solution in an electrolyte when a current passes from the anode to a cathode.

In anodic pickling and in electropolishing, work is connected to the positive pole of a suitable current source and usually immersed in an acid electrolyte. Metal is removed from the work under the combined action of the acid and electric current. In electropolishing, the metal removal is selective. Microscopically protruding points of the surface of the work are preferentially attacked and a leveling action is obtained.

Electrolytic machining is similar in principle to electropolishing in that both are essentially deplating processes; both give extraordinarily good finishes. The difference between them lies mainly in the practical ways in which they are carried out.

In electrolytic polishing, a voltage of 10-25 and a current density of seldom over 10-25 amp per sq in. are used. Distance between positively connected work and negative cathode is generally above 1 inch.

High Current Densities—In electrolytic grinding and machining, work is also connected to the positive pole of a suitable current source such as a rectifier or a motor generator. Voltage is in the same range as in electropolishing. Current densities are much higher, reaching up to 1500 amp per sq in. Since rate of stock removal in the electrolytic process, in unit of time, is a function of the current, rate of stock removal in electrolytic grinding and machining is many times that obtained in other electrochemical processes.



High current densities are made possible by three factors: Close spacing between work and cathode (less than 0.001-inch); cathode is constantly moved in relation to work at a high speed; and electrolyte is applied under pressure at a fast rate of flow into the gap between work and cathode. This causes a rapid replenishment of fresh electrolyte to the cutting area and a rapid removal of dissolution products from the gap be-

RELATIONSHIP BETWEEN VOLTS, AMPERES AND STOCK REMOVAL IN ELECTROLYTIC GRINDING OF TWO GRADES OF TUNGSTEN CARBIDE

Specimen	Carboloy No.	Volts	Amp.	Grams/Min.	Cu. In./Hr.
A_2	999	0	0	0.04	0.00775
B_1	999	5	16	0.3	0.0725
B_2	999	10	24	0.24	0.058
A_1	999	15	36–38	0.36	0.0865
C_2	883	0	0	0.02	0.0049
C_1	883	5	16	0.2	0.049
D_1	883	10	24	0.26	0.036
D_2	883	15	36–38	0.4	0.098
G	883	15	36–38	0.44	0.108

By GEORGE KEELERIC
Research Engineer
United Drill & Tool Corp.
Chicago

tween work and moving cathode. This reduces the cathode-anode polarization which is the principal limiting factor in employing high current densities.

Plunge Grinding—Fig. 2 shows schematically a setup for electrolytic plunge grinding of a profile using a profiled metal cup wheel as a cathode. The wheel cathode (A) is mounted on spindle of motor (B) and preferentially electrically insulated from the spindle. Through brushes (C) the wheel is connected to the negative terminal of the rectifier (D). Positive terminal of the rectifier is connected to a solenoid (E) which surrounds the work holder (F). The work holder can freely move within the solenoid. The other end of the solenoid is through a flexible wire connected to the work

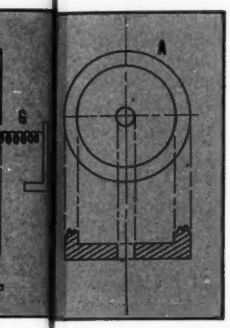


Fig. 2 — Setup for electrolytic plunge grinding a profile using profiled metal cup wheel as cathode. Lettered parts are identified in text

holder. A spring (G) tends to press the work and work holder against the wheel. (H) is a reservoir for an electrolyte which, through a pump (I) and a nozzle (J) can be supplied under pressure to the gap between work and wheel.

The solenoid is so arranged that its action counteracts the action of the spring. In other words, when current flows through the solenoid it tends to pull the work holder and the workpiece away from the wheel while the spring tends to press them against the wheel. By proper adjustment of solenoid and spring, it is possible to maintain the very small gap-distance constant in spite of the continuous removal of stock from the work.

Maintain Gap Distance—Importance of keeping a small gap-distance can be understood by looking at Fig. 1 which shows the relationship between gap-distance and current when plunge grinding a ⅜-inch diameter hardened high speed steel (Rockwell 63-C). It shows how fast the current falls off, and thereby the rate of stock removal when the gap-distance is increased. Minimum distance is the distance at which, at a given voltage, maximum current is obtained without arcs or sparks occurring between wheel and workpiece. Arcs or sparks are not permissible, as they cause wear of the cathode wheel and impair finish on the workpiece. The former is especially important in form grinding.

Cutting rate in this particular case, carried out in a setup substantially according to Fig. 2, amounts to 0.001-inch per second, with current of 135 amp (1600 amp per sq in.). Cutting rate is practically independent of the hardness of the material. With such an arrangement, not only steel may be ground but other metals such as copper, aluminum, titanium, and alloys thereof. Finish obtained is independent of the current and therefore also of the rate of stock removal; a finish better than 5 inches rms is easily obtained. Electrolyte consists essentially of neutral solutions of sodium salts in water.

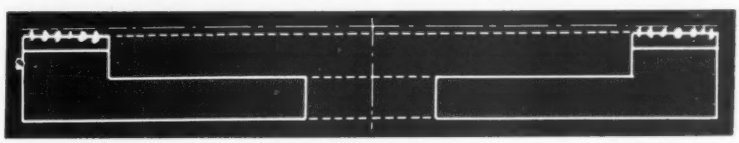
Insulating Spacers—Instead of using an electromechanical device for obtaining a spacing between wheel cathode and work as the one described above, electrical insulating spacers may be imbedded in the metal surface of the wheel cathode. Cross-section of such a wheel is shown in Fig. 3.

Particles embedded in the surface must protrude evenly above the metal bond to provide a good bearing surface on which the work may slide. Particles employed may advantageously be diamond particles of around 100 mesh. Diamonds are excellent insulators and the most abrasive-resistant material known. However, as pressure of work against the spacing particles need not be any greater than just enough to make and maintain contact with the wheel, other materials such as aluminum oxide, silicon carbide, or simply glass might be used.

When using a cathode wheel of this kind, off-hand grinding becomes practical. Any tool grinder may easily be converted for electrolytic grinding by insulating the wheel from the spindle of the grinder (for example, by Formica bushings) and connecting a rectifier or motor generator (20 v x 150 amp) to wheel and work table, making the wheel negative and the grounded work table positive. If the grinder does not already have attachments for wet grinding, a pump and reservoir for supplying the electrolyte must be added.

Tungsten Carbides Ground—For grinding cemented tungsten carbides a wheel with spacing devices imbedded in the surface becomes mandatory. Tungsten carbide forms on the surface, under influence of current and the electrolyte, an electrical insulating film, which would, if not continuously removed, prevent further attack. This film, which consists mainly of oxides of tungsten, is soft and easily removed by the wiping action of the spacing particles, allowing continuous stock removal. Stock removal is not nearly so fast as that obtained in electrolytic grinding of metals or alloys, but still fast

Fig. 3—Cross-section of wheel cathode. Instead of using an electromechanical device for obtaining spacing between wheel cathode and work, electrical insulating spacers may be imbedded in the wheel cathode's metal surface



enough to compete with conventional diamond wheel grinding.

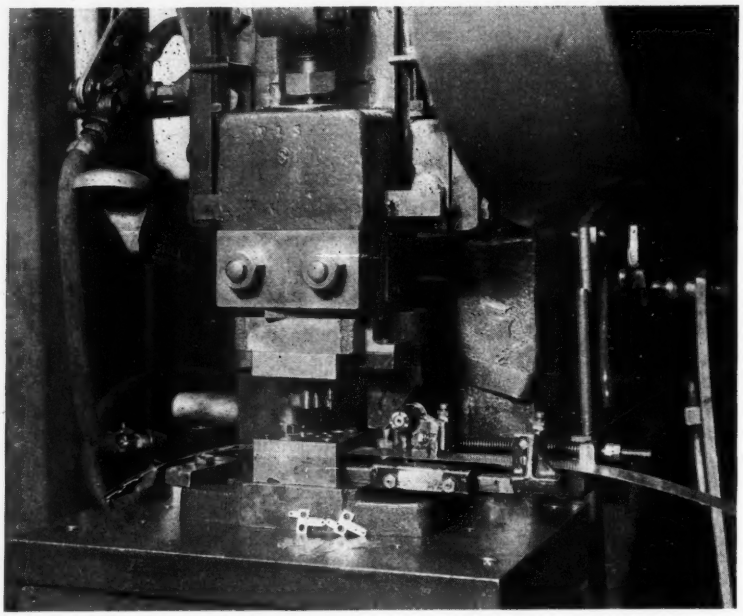
The accompanying table shows the relationship between volts, amperes and stock removal in electrolytic grinding of two different grades of tungsten carbide. Carboloy grades 999 and 883 respectively, in form of ⅜-inch diameter cylindrical rods were fed perpendicular into a cup-shaped cathode wheel at different voltages and amperages. A spacing between the cathode wheel and the Carboloy was obtained by 90-100 mesh diamond particles imbedded in the cathode surface, the diamonds protruding less than 0.001-inch above the cathode surface. No more pressure than that necessary to keep the work in contact with the diamond particles was employed.

The pH of the sodium nitrate solution varied from specimen A 1 to G from 7-8. Each sample was run at least 5 minutes. With the protrusion of the diamonds employed (spacing) during this experiment, higher voltages than 15 would result in sparks being generated between the cathode wheel and the Carboloy specimens. Maximum current density obtained under these specific conditions was 345 amp per sq in.

With smaller anode contact areas (of tungsten carbide) a higher current density is obtainable (but a smaller absolute amperage) due to increase flow of the electrolytes. Conversely, at larger anode areas higher amperages are obtained but the current density will be slightly lower up to an area of 1 sq in. at which point efficiency falls off due to faster dissipation of electrolyte in the anode-cathode area. Finishes obtained were below 15 microinches rms for all the samples.

Scrap Course Set for August

A training course for junior executives in the scrap industry will be held at Carnegie Institute of Technology, Pittsburgh, the week of Aug. 24. Sponsored by the Institute of Scrap Iron & Steel Inc., it will feature lectures covering various phases of the ferrous scrap industry and general economics applicable to the industry. Registration will not begin until the institute works out the details.



Two-station progressive die equipped with a Dickerman 2-inch hitch feed turns out 7000 pieces per hour, 300 per cent increase over hand feeding

Mechanical Die Feeds . . .

More Production, Less Effort

Companies report phenomenal production increases when mechanical die feeding equipment is used in combination with progressive die stamping operations

By J. VAN EATON

WHILE the hand may be quicker than the eye, it's no match for mechanical methods of die feeding. Many metalworking plants chalk up phenomenal production increases over former hand methods by combining mechanical feeding with progressive dies.

Federal Tool Corp., for example, installed a progressive die equipped with a Dickerman die feed. Installation permitted combining operations of three single dies into one progressive operation that produced a complete part with each stroke of the press. Production zoomed to 5000 pieces per hour. Company requires only one third as many presses, only 8 per cent of man-hours previously required. Progressive dies account for approximately 40 per cent of the increases, the die feed, 60 per cent.

Die Design Important—Not all dies can be mechanically fed. The success with which a die may be fed depends on the die design more than design of the part being produced. Die should be designed with the thought in mind that it will be used with a mechanical feed. Dies must permit stock to pass freely through the die without being hung-up. There must be no obstructions.

There is a certain amount of elongation of stock in swage-flattening which must be provided for in die design. Unless provided for, elongation creates a feeding problem because uniform lead required between stations is upset. Material will slip back through feeding

mechanism. Provision must be made to avoid marring stock at gripping points.

Design dies so punches and pilots leave path of stock as early as possible. This is true of forming and drawing dies, and is important because a larger portion of the press cycle may be needed for feeding purposes. Keep the rate of stock advance into the die at a minimum. Then greater accuracy and control will result even at high press speeds.

Provide some means for positive registration (in progressive dies) in the die of the material being fed. Pilots, fixed stops or other devices should be used to correct for slight inaccuracies in feed lengths, alignment of stock, etc.

Mechanical Feeds — There are two types of mechanical strip stock feeds: Roll feeds and slide feeds attached directly to the press and becoming a part of the press; and hitch feeds and die feeds which are a part of the die or of the press.

A roll feed is merely two rolls driven by an overriding clutch or ratchet mechanism. It is driven and timed by the press power shaft. Feeding cycle starts when press slide is at mid-stroke up and continues through 180 degrees of crankshaft rotation until slide is at mid-stroke down.

Three types are obtainable: Single, double and triple. First two are most popular. These rolls feed from one side only. Some can be mounted to feed from front to back, but provision must be made to swing them out of the way for die changes.

Double roll feeds have two sets of rolls at opposite sides. They are synchronized by press action. Rolls feed short lengths of stock through a die, and avoid loss of stock at end of each strip.

Feed crank is timed with press crankshaft. Feeding action stops when feed travels at maximum speed. Over-feed results as the sudden stopping of feeding action causes rolls to over-ride. A brake incorporated in the rolls overcomes over-ride.

Slide Feeds—Slide feeds have a reciprocating head carrying a gripper shoe which clamps stock on its forward stroke, releasing it on the back stroke. A gripping member, spring-loaded, is attached to the main frame. Member holds stock motionless on return head stroke, prevents stock from pulling back out of die gripper guides.

Like the roll feed, slide feed is driven from the crankshaft of the press by an adjustable throw block and lever. Amount of reciprocating head travel determines the feed length. Stops at either end of feed frame control feed length. Slide feeds operate from one side of the press.

Die, Hitch Feeds—Hitch and die feeds operate independently of the press and may be quickly installed in any press, hydraulic or mechanical. They may be fed from any angle. Usually die and hitch feeds affixed to the die-set as a feeding mechanism for a particular die can also be attached to press bolster plate. Two feeds may be used on the press, both feeding stock.

Hitch and die feeds possess a high degree of accuracy and can be adjusted to feed from zero to their maximum limits in increments of 0.001-inch for each stroke of the press. Accuracy is possible because of the positive feed control. Sliding member of the feed moves between the operating cam at one end and the fine feed adjustment stop nuts at the other.

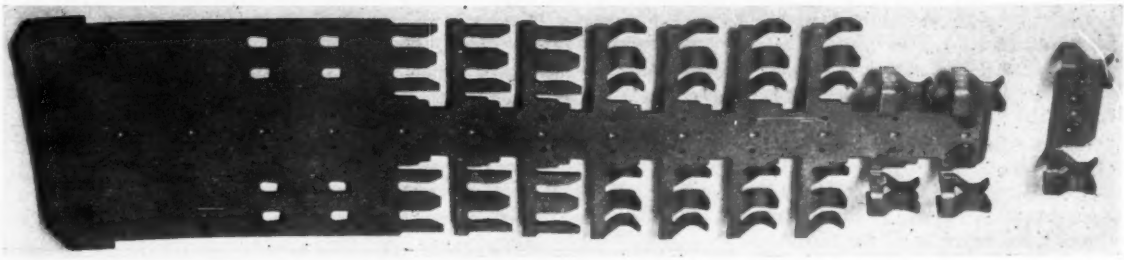
Hitch feeds and die feeds consist of a gripper plate or set of gripping cylinders affixed to the sliding members of the feed, a second similar gripping unit is fixed to the main frame. Sliding member of feed moves forward to grip material and advance it across the die. When slide moves back, rear gripper plate grips stock and prevents it from backing out of the die. Front gripping members slide or roll freely over the material to a new gripping point. Feed occurs during upstroke of the press when feeds are used as push feeds and during the down-stroke when used as pull feeds. On larger die feeds, one half the feeding is accomplished on the up-stroke, the other half during the down-stroke.

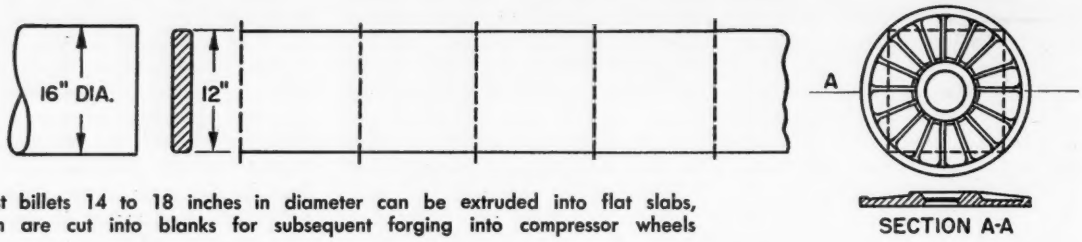
Stock Straighteners — Stock coiled for a long period of time usually takes a set. Curvature is induced by the cylindrical shape of coils and may be removed by a stock straightener—a series of rolls designed to flex stock back and forth as it is drawn through. Straighteners, unless power driven, impose an additional load on the feeding mechanism which may cause slippage and inaccuracies.

Illustrated is the progression through a 13-station die, equipped with a die feed, for production of electrical outlet contacts. Press operates at 150 strokes per minute with lead of 13/16-inch per stroke. Production, allowing for coil changes, is 6400 pieces per hour.

Also shown is simple 2-station progressive die equipped with a Dickerman 2-inch hitch feed for automatic production of the RC 30 switch leaf for Motorola record changers. Press operates unattended at 144 strokes per minute, with a lead of ¾-inch per stroke. Production is 7000 pieces per hour.

Production of electrical contacts on a 13-station die equipped with die feed soared to 6400 pieces per hour compared to 2000 per hour without feed





Cast billets 14 to 18 inches in diameter can be extruded into flat slabs, then are cut into blanks for subsequent forging into compressor wheels

STEEL EXTRUDING . . . *Puts the Squeeze on Conventional Forming*

Versatile extrusion process producing a variety of shapes with no more than a change of dies, deserves increasing attention for working steel and high temperature alloys

By H. J. ALTWICKER & K. F. BRAEUNINGER
Headquarters, Air Material Command
Wright Field, Dayton, O.

EXTRUSION is the only process capable of converting a round block of metal into a profiled shape. Rapid and economical, it produces a variety of wrought products of high dimensional accuracy and good mechanical properties. Machining and finishing operations are held to a minimum. Yet manufacturers are hesitant to apply the extrusion process to ferrous metals. Fostering hesitancy are improved rolling techniques and ingenious materials handling methods in steel plants.

When small quantities of special shapes are needed, it is more economical to produce the part by extrusion, the cost of an extrusion die being less than the cost of proper caliber rolls for rolling. Versatility of a single extrusion press in its ability to produce a greater range of sections with no more than a die change indicates process deserves increasing attention for working steel and high temperature alloys.

With extrusion, metal inside a container is put under pressure from all sides giving an ideal break-up of the primary structure of cast billets. Over-saturated alloys can be worked by the extrusion process more economically than by rolling mills. Grain boundaries are stressed by compression in extrusion, while rolling also stresses them by tension. High-strength light metal alloy billets are less sensitive to compression stresses than tension stresses.

Aids Forging Operations — Extrusion can be used for breaking down these billets into simple sections for forging stock. Process improves structure and properties and increases forgeability of any alloy. It reduces number of blocking operations and conserves man-hours. Pre-extrusion of high alloy steels and heat resistant alloys will prove sound and economical even if at low extrusion ratios of 1:3 or 1:4.

Other Uses — Many possibilities are offered in the manufacture of extruded shapes from high strength alloys. Design and preparation of dies, mandrels, pressure disks and containers is an important factor in this type of extrusion. These tools are exposed to the hot metal and must withstand combined effect of thermal and mechanical stresses. They must be designed for maximum wear resistance.

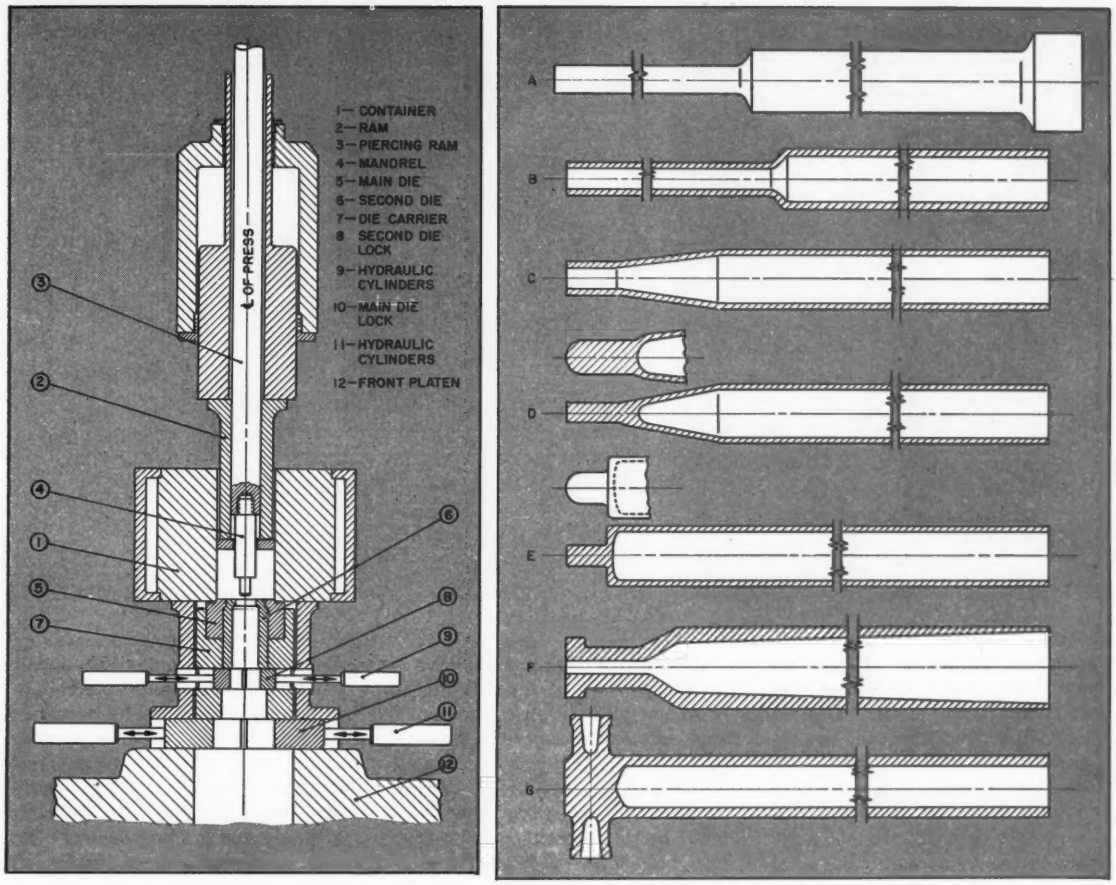
Protection of dies and mandrels by hard facing is successful. Nonferrous cobalt, chromium and tungsten alloys are applied by welding to a depth of 1/16 or ⅛-inch over the surface to be protected. Erosion and abrasion can be repaired by re-welding and grinding to size.

Most important is the removal of scale which acts abrasively on forming dies. Extrusion of scaled billets will result in locally or completely washed out die contour, after a few cycles. Submersion of billets in molten salt after pickling or sand blasting cuts off influence of atmosphere during heating to high temperatures. Liquid salt protects billet during transfer from furnace to press.

Presses for high temperature alloy and steel extrusion should be powerful and fast working to avoid destructive effect of heat during the extrusion stroke. Actual extrusion time should not exceed 3 to 4 seconds. Mannesman Co. in Germany has extruded stainless steel tubes at the rate of 25 feet per second.

COMPARISON OF PROPERTIES OBTAINED IN EXTRUDED AND ROLLED MATERIAL

Alloy		Ult. TS psi	Yield Str. psi	Elong. %
Mg plus 1.8% Mn	Extruded 1 in. Dia. Bar	41,000	27,000	8
	Rolled 0.04 in. Sheet	29,000	15,000	10
Al-Zn-Mg 10 Days Naturally Aging after Quenching	Extruded ½" Dia. Bar	81,000	60,000	12.8
	Rolled 0.04 in. Sheet	63,500	41,000	18.5



Schematic drawing of press suggested by the authors for combining extrusion and forging. At right, hollow and solid parts that could be produced

Liquid Cooled Dies—Just as liquid cooled dies aid in high speed extrusion of light metals, they are helpful with steel and high temperature alloys. Die cooling reduces the severe abrasive effect of the outflowing hot metal. Both hard facing and cooling contribute considerably to die life.

If made under proper conditions, extruded products have better mechanical properties than rolled material. Ultimate tensile and tensile yield strength is higher for extruded metals, although elongation is greater with rolling. Press effect is apparent from figures in the accompanying table and determines the extent of high tensile properties. Extruded structure has stability under subsequent heating conditions since the beginning of re-crystallization is moved to a higher temperature range. Extruded material is relatively insensitive to local grain growth during preforging operations.

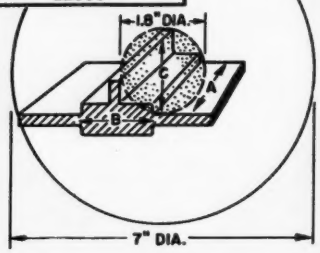
Aids Metal Properties—Definite relationship exists between properties obtainable by extrusion and the amount of work put upon the metal. When reduction of the billet area is not less than 90 per cent of the initial section or when extrusion ratio is not lower than 1:10, difference in properties between center and periphery of the extruded section is practically negligible. High level properties can be obtained only when percentage of area reduction is sufficiently large.

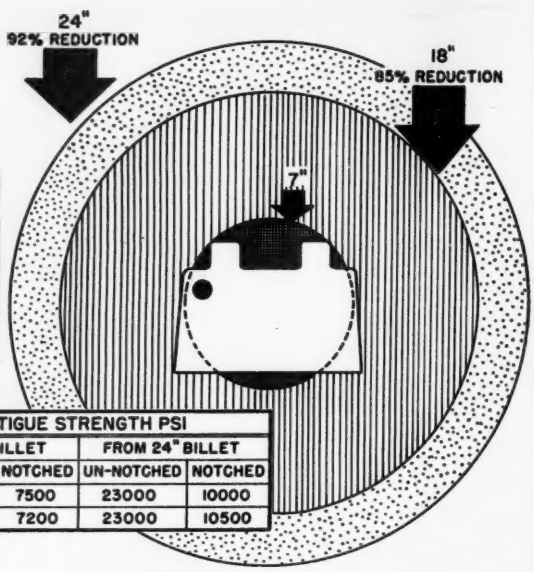
Illustrated is a section extruded from a 7-inch billet. The area of the inner circle is equal to the area of the extruded shape from which fatigue tests were made. Area of the original billet reduced by about 92 per cent. This high rate of deformation results in uniform fatigue properties found in three different directions.

Assuming that the largest container available (18-inch) was used to extrude the heavy spar cap section shown in the second illustration, the ratio of deformation corresponds to transformation of an 18-inch round billet to a 7-inch round bar—only 85 per cent reduction. Range of deformation has not been sufficiently great to achieve high level properties. If the same section could be extruded from a 24-inch billet, fatigue properties 25 per cent higher could be obtained.

Heavy Sections Limited — At present, high level properties cannot be obtained in all instances with heavy extruded sections. Calculations indicate the limit is determined by an area of the extruded section not larger than 25 square inches. If larger section areas are to be extruded, the design engineer cannot base his calculations upon high level proper-

DIRECTION	FATIGUE STRENGTH PSI
A. LONGITUDINAL	23000
B. LONG TRANSVERSE	22000
C. SHORT TRANSVERSE	22000





Piece extruded at left brought about a high rate of deformation (92%), resulted in uniformly high fatigue strength. Piece on right represents a reduction of 85%

ALLOY	FATIGUE STRENGTH PSI			
	FROM 18" BILLET		FROM 24" BILLET	
	UN-NOTCHED	NOTCHED	UN-NOTCHED	NOTCHED
75 S	18400	7500	23000	10000
14 S	17500	7200	23000	10500

ties of the material. Properties around the center of larger sections tend to be lower. Desired construction rigidity can be obtained by joining several small sections to build up one heavy section.

A need exists for heavier extrusion presses that will produce large dimension sections with high level properties. For example, a 25,000 ton press can produce sections up to 95 sq in. with equal mechanical properties in the center and peripheral areas.

Column distances available on a 25,000 ton press make it possible to utilize flat containers as well as round containers. It is calculated that pressure of 38,000 tons would be required to extrude a section 40 inches wide. But with a rectangular container 48 x 8 inches, only 12,000 tons pressure is required. Use of flat containers can increase potential of heavy extrusion presses specifically toward manufacture of wide sections with relatively small wall thicknesses. Manufacture of flat and wide sections will reduce difficulties involved in straightening after quenching.

Before extrusion, billets should be brought into closer configuration to the shape of the extruded section. This improves friction conditions of container and extrusion die which means that intricate extruded sections can be produced at reduced pressures, lower costs.

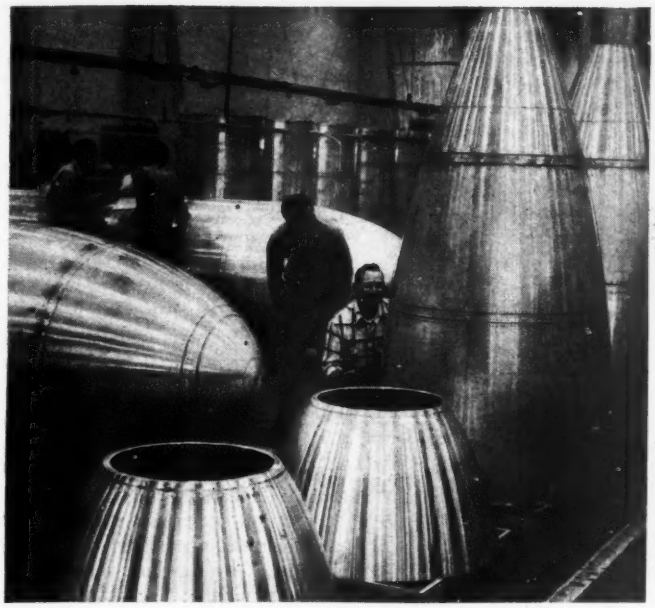
Combined Forging, Extrusion — A feasible way of forming metals is to combine forging and extrusion, although only experimental model presses for this purpose exist at the present time. A wide range of hollow parts now being made as solid forgings and requiring conversion of 90 per cent of the material into chips, could be made as hollow extrusion forgings. Landing gear parts, for example, have a number of common features that indicate extrusion methods could be applied.

Illustrated is the writers' conception of the operating part of a press that could be used for step extrusion, combined extrusion and forging, inverted extrusion, progressive piercing and operations requiring movement of the mandrel independent of ram travel. Features of press include: Double or triple locking frames, each one independently usable; die carrier of telescope type for large split dies; large die carrier exit and independently movable piercer arrangment with powerful actuation. Both press and piercing arrangement have variable stroke limits during operation. Press should also be equipped with powerful gripping and guiding devices. Several configurations of hollow and solid parts easily produced on a multipurpose press in one heat and one combined operation are illustrated.

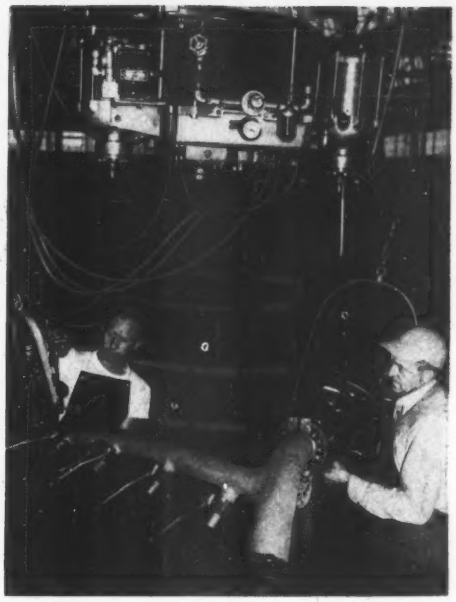
For extrusion of shapes gradually changing their cross section in one plane, additional cylinders perpendicular to the length of the press are required. Motion of these cylinders should be automatically controlled and programmed during the actual extrusion stroke in accordance with the motion of the extrusion ram. Up to seven cycles of operation during one extrusion stroke were possible with an experimental device, and the same number of parts were produced.

OUTPUT INCREASE BY USE OF LIQUID COOLED EXTRUSION DIES

Dimension or Shape	Alloy	Press Capacity Tons	Output Improvement in %
1.5 in. dia.	AL-MG 7	1500	78
2.0 in. dia.	DBA	1500	100
2x3½ in. sq. in.	Mg AZM	3500	130
6½ in. dia.	Mg AZM	3500	80
2 in. dia.	Mg AZM	3500	73
3½ in. dia.	Mg AZM	3500	66
2½ in. dia.	AL Mg 9	3500	60
4 in. dia.	AL Zn Mg	3500	73
6½ in. dia.	Dural	5500	42
3½ in. dia.	Dural	5500	58
1½ x 11 in. flat	Mg AZ855	5500	56



Fuel tank sections are completely seam welded to achieve one continuous and smooth aerodynamic surface



Twin spot welding guns used to join components for Pratt & Whitney reciprocating engine exhaust systems

Bigger Welders Do Bigger Job

Technical advances, special king-size resistance welding equipment extends welding techniques to fabrication of load bearing structures for heavy duty aircraft

SPOT WELDING gets a star billing at Ryan Aeronautical Co., San Diego, Calif. Company uses specially designed spot welding machines said to be the largest in the country, to join exceptionally large structures and heavy gage metals.

Only recently has spot welding been possible for fabricating large aircraft components. Long regarded as promising, its extended use was handicapped by inaccurate timing, insufficient current capacities and pressures. Application was limited to small secondary components and thin-gage materials.

Welding machine manufacturers have overcome these difficulties with heavy duty equipment like Ryan's. Equipment is engineered to fabricate primary, load-carrying aircraft structures and heavy gage metals of many types. Company claims spot welded joints in stainless steels that are 100 per cent efficient compared with 60 per cent efficiency for riveted joints.

Big advantage of spot welding for aircraft parts is no increase in weight. Surfaces are left smooth and clean with no bulges to interfere.

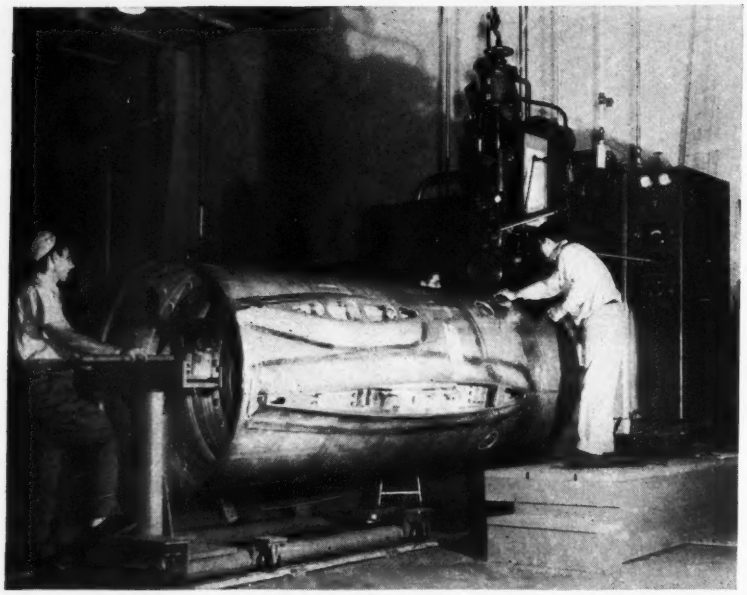
Example of product possible with this precision spot welding is the external wing fuel tank. Torpedo-like containers gain from spot welding light weight design, aerodynamic smoothness. They are fabricated by rotating electrodes which produce overlapping spot welds. Seams are gas-tight, need no sealing compounds.

Spot welding primary structures such as floor beams for cargo aircraft would have been out of the question not long ago. Today spot welding is used to fabricate complete sets of 49 floor beams for cargo aircraft which transports 68,000 pounds of freight. One thousand spotwelds are placed in each I-beam assembly.

For jet engines, combustion chambers and transition liners of Inconel, tail pipe assemblies of stainless steel are formed by spot-welding. Stainless steel, nickel base alloys are well suited to spot welding because their high electrical resistance shortens heating time.

Ten years ago, spot welding equipment was capable of developing only 40,000 amperes on short circuit and exerting no more than 1500 pounds pressure between electrodes. Contrast those figures with today's 120,000 amperes and force of 9100 pounds. Advances include improvement in electronic controls, which program periods for squeeze, weld, forge within a half-second time cycle, at the rate of 120 welds per minute.

Slope Control — During period when firing of the welding current occurs, inrush of current is momentarily dammed and then allowed to build up in a crescendo. Split second restraint gives added time for welding heat to be better absorbed by metal surrounding spot weld. This avoids splash or



King-size Federal seam welding machine welds external aircraft fuel tanks

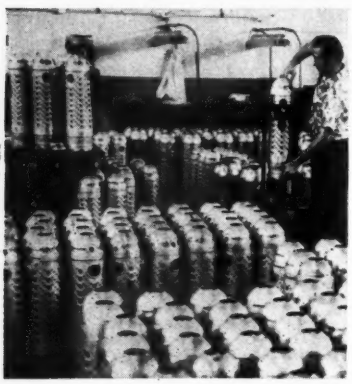
explosion of hot metal from sudden heating. Method permits placement of larger spot welds in smaller areas close to outer edges.

Diminution of current is controlled after welding to retard metal cooling and prevent shrinkage cracks. Control is valuable in fabrication of aluminum alloys which cool quickly. In effect it makes current "die down gradually" in a few hundredths of a second.

Controls allow reduced heating current prior to welding. Thick gaged metals can be preheated to allow electrodes to seat better. Heavy metals can be spotwelded with lower currents. Reduced heating can be applied in same manner after welding to temper spotwelds without recourse to furnacing.

Controlled Cycle Firing—Electronic controls permit the harnessing of fractional cycles from the three-phase, 60-cycle current in the Ryan plant. By firing welders on half-cycles, short heating currents are possible for spot welding thin-gage aluminum alloys requiring high current, short time values.

By tapping welding current wave on alternate plus or minus cycles, a unidirectional spot weld can be made which is uniformly off center. In welding sheets of different thickness, this dislocation can be used to cast the spot weld deeper in the thicker sheet for uniformly strong adherence.



Seam and spot welding join components fabricated from Inconel for jet engine combustion chambers

Welds on Castings Investigated

Complimentary copies of "Recommended Practice for the Welding of Steel Castings" are offered by Tempil Corp. Normally obtainable from the Steel Founders' Society of America, publishers, at 35 cents a copy, the booklet serves as a reference manual. Both repair and fabricating welding of castings is discussed. Requests should be sent on company letterhead to the Tempil Corp., 11 W. 25th St., New York 11.

$10 Million Saved

Dividends come in improved use of labor, machine and material. Less scrap is the bonus

QUALITY control system in operation at 21 of the International Harvester Co. plants has improved product quality, cut basic material requirements and eliminated $10 million worth of labor and material losses over a four-year period. Applications will be shown by the company at the ASTE Industrial Exposition on Mar. 17.

System checks and controls three variables in production operations: Operator, machine and material. Checks on accuracy of production parts tell when one of the variables needs correction. End results of system are that a minimum number of scrap parts are produced, salvage operations avoided, and uniform parts produced to close tolerances.

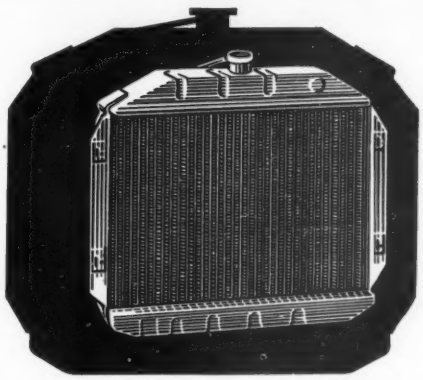
Samples Cited—Typical of gains divisions are achieving through quality control is the recouping of $250,000 worth of material and labor at the Indianapolis Engine Works on cast iron crankcases alone. Control of foundry and machine shop operations which cut scrap in the machine shop as much as 56 per cent made this possible. At Wisconsin Steel Works, 2643 tons of steel were saved in one year by closer control of the diameter of round and square bar stock and thickness of flats.

"Quality control methods are one way that manufacturing plants can up production without adding machine tools or speeding up production lines," says A. C. Richmond, general supervisor of Inspection Methods Research. Essentially the system works like this: Accurate measurements of the dimensions of a series of five consecutive pieces produced by a particular machine are taken. Quality control engineer uses statistical methods to determine upper and lower limits of the particular dimension being produced. When parts are produced within these limits production is said to be in control. Charts showing state of control of the operation are placed on the machine in full view of the operator. Operator can easily see whether

To our Colleagues in American Business . . .

Substitution of materials is of considerable concern to many manufacturers these days. Never before have we seen so much interest in the subject. However, it is by no means new to Revere, which has always held to the principle of recommending the metal that will best serve the customer. Thus, we have often suggested switching from one metal or alloy to another, with the object of lowering costs, increasing production, improving service, or all three.

When based on a detailed study of all the factors involved, substitution at times can be extremely valuable. In fact, the ever-increasing quality and service to be found in American products is due in part to the continued search for better materials, and their adoption when found. Better materials, better design, finer workmanship—these are part of American progress.



But there are instances, of course, when no practical substitute can be found, when only one material offers just the right combination of good qualities required for a given application. Take the automobile radiator. This has always been made of copper, because copper is the one and thus far only metal that perfectly meets all the requirements of manufacture and service. To make a radiator, very thin copper sheet and strip must be crimped, bent and otherwise formed. Copper's easy workability makes it ideal from the manufacturing standpoint. After assembly, the radiator is cleaned, and made water-tight by dipping in a bath of hot solder. Copper is exceptionally easy to solder. When in service on a car, truck or bus, the radiator must not rust, and must resist corrosion by water and anti-freeze. Copper is notable for its resistance to corrosion in such use. The radiator must also cool the water by radiating its heat into the air stream; copper has the highest heat conductivity of all commercial metals. A copper radiator thus is the most efficient and durable. It should outlast the car unless accidentally damaged, and when the injury is not so great as to make replacement necessary, the nearest shop can make repairs easily.

Recently it has been suggested that automotive radiators should be made of aluminum. However, both copper and aluminum are temporarily in short supply, and therefore to substitute one for the other does not appear to be practical. Beyond that, we do not believe —based upon experience to date—that aluminum's qualities, fine though they are, necessarily make it suitable for automotive radiators. In addition, the difficulties of retooling in the factory and repairs in the field must be considered. Revere fabricates both copper and aluminum, and we have reason to believe that our impartial advice to stay with copper for automotive radiators is concurred in by radiator manufacturers.

When you are tempted to substitute one material for another in your product, no matter what it may be, make certain you obtain all the facts as to costs, production, service. Your suppliers will be glad to collaborate with you in studying the effects of a proposed change. We suggest you take full advantage of their knowledge and experience.

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parts he is producing meet the quality requirements.

Operators Like It — Practice shows these that statistical control methods meet with approval of the operator because he can see exactly where he stands on production accuracy. Often the machine or material rather than the operator is to blame for making scrap. Operator often makes more accurate parts by just putting his operation under control. Quality control charts provided for him let him see with his own eyes how he is doing. These charts offer him a challenge, not of production speedup, but of producing better parts with minimum scrap.

Methods are also used to spot machines in a battery that do not produce parts of required accuracy. Machine then is repaired or put on another production operation where less stringent accuracy is required.

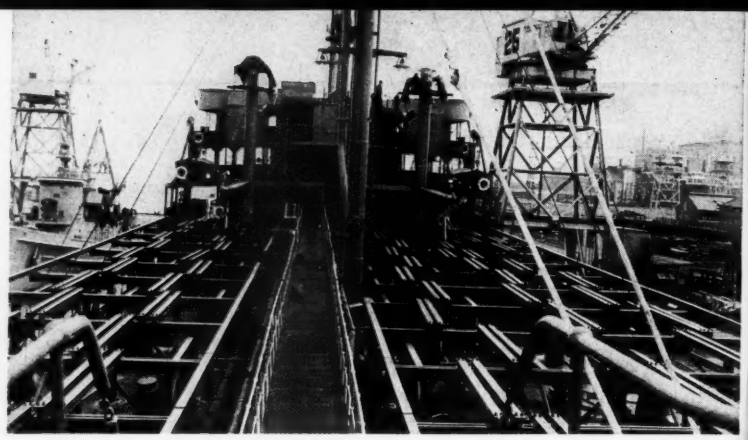
Predicts Trouble—Another advantage resulting from the precision control method is that statistical checks can actually predict when parts will be produced that will not meet specifications. Corrective measures can be taken before scrap pieces are made.

In one foundry, mold hardness, core hardness and pouring temperatures together with several other operations are controlled with the result that scrap has been cut 32.5 per cent. Controls on machining operations on a crankcase resulted in an improvement of 47 per cent in rework and 56 per cent in scrap.

Electronics Misuse Studied

Engineering department of the Radio-Television Manufacturers Association is establishing a committee to gather information to be furnished to end equipment designers relative to the proper ratings and environmental conditions of tubes and other components. Purpose is to prevent the failure of electronic equipment through misuse.

According to Associate Director Virgil M. Graham, the committee is set up with members from the RTMA engineering sections together with representatives from the Joint Electron Tube Engineering Council and others.



Horizontal members of structure can be moved to fit the plane's wheelbase. Space under framework permits easy access to valves and operating facilities

Airplanes Thumb a Ride on Tankers

AIRCRAFT ride to battle zones on a skeleton aluminum framework mounted on tanker deck, utilizing otherwise unusued space. Even the heaviest structural component can be lifted by two men and the entire unit can be put up and taken down by the ship's crew with wrenches.

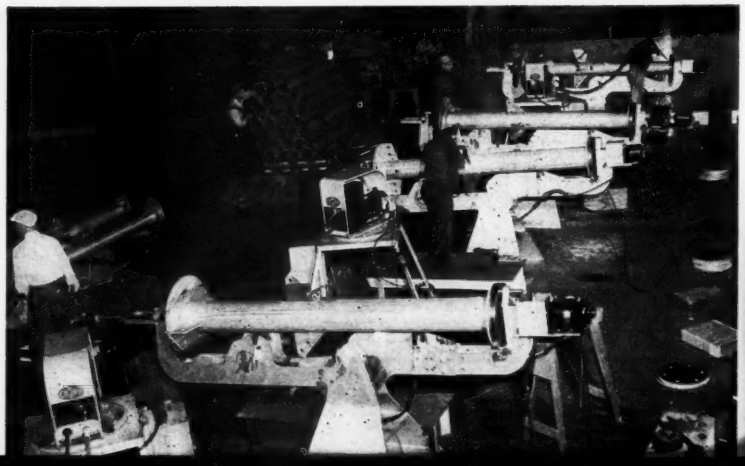
Bethlehem Pacific Steel Co. in its San Francisco yards recently completed 20 sets of this portable decking. They used 1,720,000 pounds of aluminum from Kaiser Aluminum & Chemical Corp., Oakland, Calif. Only steel used is 5000 standard 1-inch and ⅞-inch bolts for each installation.

Structure consists of I-beams mounted on 9-inch supporting columns. Beams can be moved to accommodate plane's wheelbase. There are no drilled holes in the entire unit. All bolt holes are punched. For this operation a fixture was added to a press brake converting it, in effect, to a punch press. Special welding positioners designed to hold the 9-inch columns rotate the work slowly during the base welding operation. Aircomatic welding process developed for aluminum by Air Reduction Co. is used.

Entire structure does not interfere with tanker's normal operation. Only permanent part of the installation is series of 150 inverted saucerlike bases welded to the deck. All the ship's main deck fittings and valves are accessible.

Tankers doubling for flat-tops are the standard T-2 type operated by the Military Sea Transport Service. The 12,000 sq ft deck space carries a varying number of planes, depending on the size, with beams adjusted to fit wheelbase.

Welding positioners hold 9-inch columns. Electric motors rotate workpiece slowly for base welding operation. Aircomatic aluminum welding is used



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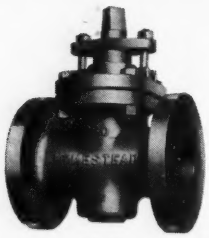
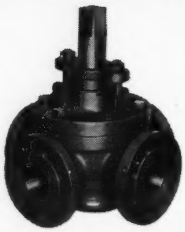


Straight-way—
Flanged or Screw Ends

Three-way—Screw or Flanged Ends



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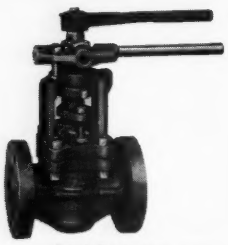
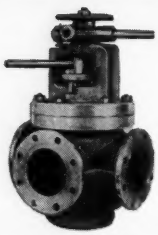
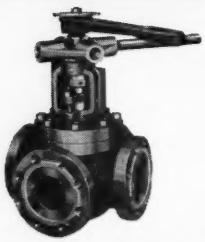


Straight-way—
Flanged or Screw Ends



Three-way—Flanged or Screw Ends



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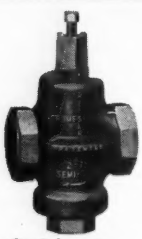
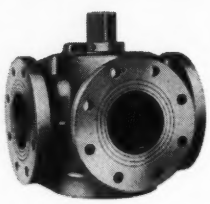


Straight-way—
Screw or Flanged Ends

Straight-way—
Worm & Gear Operated



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BLAST FURNACE PRACTICE

Generation, Recovery and Use of Heat—VI(d)

Existence of high temperature zone in every blast furnace operation causes carbon solution loss reaction. Carbon in the form of CO, can be returned to the furnace as blast heat

VARIABLE conditions under which iron is reduced in the blast furnace, as indicated by the Bureau of Mines research, are believed to be a conclusive answer to the more or less controversial question of thermal requirements for reduction of iron (Fe) from iron silicate. Although data of the Southern furnace operation (technical paper No. 391) does not specifically refer to iron silicates the burden included 25 per cent of nodules containing 10.80 per cent silica; therefore, it is reasonably certain there was a substantial percentage of iron silicate in the burden. The East burden contained sinter, open-hearth slag, and roll scale, thus providing a substantial percentage of silicate, but it had a low fuel rate. Without question, the iron silicate compound must first be decompounded to release iron oxide for reduction. Heat is consumed in the process, but this heat should not be considered as a separate charge against furnace thermal economy because the amount would be consumed anyway in the formation of slag whether the gangue of the silicate was charged into the furnace compounded in a silicate or as oxide in ore.

Aside from iron oxides which are compounded in iron silicates in sinter, open-hearth slag, and roll scale, the burden materials and operating conditions of East are ideal for reducing all iron oxides by indirect reduction with carbon monoxide (CO) above the high temperature of the bosh.

Lacks Volatile Matter—Burden materials of the East operation with the exception of fluxing stone, are entirely free from volatile matter. The low weight of fluxing stone, and the slow rate of stock travel, would give reasonable assurance that stone would be calcined near to the top of the shaft. Physical properties of East burden materials and the slow blowing rate assure uniform resistance to the passage of gas and therefore maximum gas-solid contact and uniform dissemination of heat throughout the stock column. Despite these favorable conditions for indirect reduction of Fe in the furnace shaft by CO there apparently is enough unreduced oxides delivered to the high-temperature zone of the bosh to cause virtually the same weight of carbon solution loss as occurs with the directly opposite conditions of South.

In the four operations compared in Table IX (see Part VI-b), indicated temperature differences are greater in shaft operation than they are in bosh and hearth operation, but reference to Figs. 4, 5 and 7, showing variable thermal conditions, which can exist in the bosh and hearth due to slag mineral composition and stages of formation, emphasizes the effects which such variables have on the depth of the high temperature zone in the furnace, and on the amount of heat which can be carried into the shaft by the gas leaving the bosh. Since the temperature in the bosh and hearth must always be high enough to permit the formation of slag (and this temperature is always higher than the temperature necessary to do shaft work, and high enough to permit reversion of CO_2 to CO) existence of a high temperature zone, which will cause carbon solution loss reaction, is inevitable in every blast furnace operation.

But this indication introduces another probability which apparently is sustained by actual measurement data of Table VIII (see Part VI-a). Any CO_2 generated in the furnace outside the high temperature zone, from reaction of CO plus O = CO_2, would not revert to CO but would pass from the furnace as CO_2. It has been the general practice to calculate heat production from this reaction. Therefore, it is of interest that temperatures recorded by Bureau of Mines research at the respective planes in the two furnaces show higher temperature at the sidewalls of No. 442 Northern operation, outside the high temperature at the center of the furnace, than they do in the No. 391 Southern operation, and it is logical to assume that the generation of heat from the conversion of CO to CO_2, which did not revert to CO, was a contributing cause for the higher temperatures of the No. 442 operation. A percentage comparison of these temperatures is presented in Table I (Part II). The logical thermal effect to be expected from the release of CO_2 contained in the burden materials of the South operation, would be absorption and consumption of heat to effect the release because no heat is gener-

By CHARLES E. AGNEW
Consultant
Blast Furnace and Sintering Plant Operation
Cleveland

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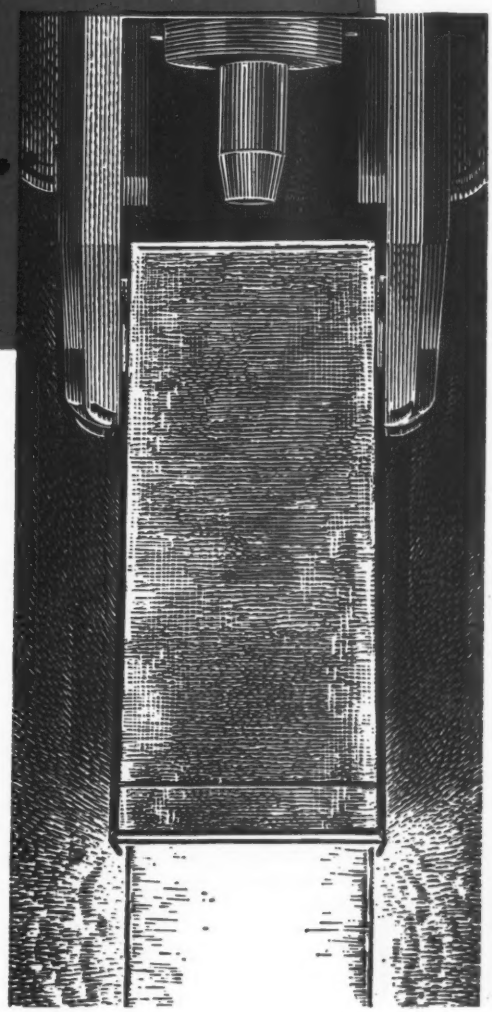

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TABLE XI

Comparison of heat conservation and recovery (Per gross ton iron, 2240 lb)

	South	North	East
Pounds of gas	13,244.89	9,359.00	6,622.00
Temperature of gas, ° F	335	325	350
Sensible heat removed with top gas (wet), Btu	1,735,469	1,452,500	700,119
Decrease from South, %	.....	1630	59.66
Decrease from North, %	.....	.....	51.79
Latent heat removed with top gas:			
CO in top gas, lb	3,868.85	2,096.64	1,719.07
Carbon in top gas CO, lb	1,658.07	898.56	736.74
Pounds carbon × 10,210 Btu	16,630,442.10	9,174,297.60	7,522,115.40
Recovered in blast (wet), Btu	2,316,539.00	2,099,000.00	1,784,403.00
Net loss to furnace, Btu	14,313,903.10	7,075,297.60	5,737,712.40
Latent heat lost to furnace, %	86.07	77.12	76.27
Latent heat recovered, %	13.93	22.88	23.73
	100.00	100.00	100.00
Heat brought into furnace with blast (wet), Btu	2,316,539.00	2,099,000.00	1,784,403.00
Btu per pound blast	239.00	311.00	388.00
Increase per pound over South, %	.....	30.10	62.30
Increase per pound over North, %	.....	.....	24.70

TABLE XII

Measurement of Efficiency for Three District Operations (Per gross ton iron, 2240 lb)

	South	North	East
Weight of gas (dry), lb	13,244.89	9,359.00	6,622.00
Weight of air (dry), lb	9,608.08	6,666.00	4,542.47
Increase weight, air to gas, lb	3,636.81	2,693.00	2,079.53
Weight increase, %	37.85	40.40	45.80
Increase weight, air to gas, lb	3,636.81	2,693.00	2,079.53
Weight of CO_2 from stock, lb	732.60	383.51	134.55
Weight increase due to CO_2 from stock, %	20.1¢	14.24	6.47
Increase weight, air to gas, %	37.85	40.40	45.80
Increase weight CO_2 from stock, %	20.14	14.24	6.47
Efficiency—combustion and/or reduction, %	17.71	16.16	39.08

TABLE XIII

Differences in Blast Temperatures (Per gross ton iron, 2240 lb)

	South	North	East
Carbon lost to solution, lb	218.52	125.38	226.49
Potential heat from carbon lost, Btu*	1,273,972	735,921	1,320,437
Blast temperature, ° F	957	1248	1550
Heat from blast, Btu	2,316,539	2,099,000	1,784,403
Potential heat from carbon lost, Btu	1,273,972	735,921	1,320,437
Total Btu	3,590,511	2,834,921	2,773,509
Blast temperature required to supply total, ° F	1483	1685	2697

* Lb carbon × 5830 Btu.

ated from the release which is reflected in the recorded temperatures at the respective planes. However, both furnaces must have generated heat in production of the difference in the weight of CO_2 contained in the top gas and the weight which was charged into the furnace with the burden materials.

Conditions Are Comparable — Applying the foregoing reasoning to the unmeasured conditions of the East operation it is reasonable to believe they would be subject to the same cause and effect as those indicated for the South and No. 442 North operations. The small weight of fluxing stone required for the iron-rich, volatile-free, burden materials of East assure minimum weight of CO_2 being released from the stock and consequently a greater weight of CO_2 in the top gas which must have generated heat and/or reduced oxides. The volatile-free materials of East would absorb this heat, hold it in the furnace, and return it to the bosh and hearth for further useful work, thus reducing the amount of heat required from the combustion of solid carbon, and reducing the volume and weight of gas which carries heat from the furnace.

The theory thus presented and supported with evidence from actual operations, appears to fully justify the statement previously made that the carbon solution loss cannot be eliminated from blast furnace operation because it is a result of operating conditions which are inherent in smelting principles, and therefore, an operation which would not have any carbon solution loss would not be a blast furnace operation. From this premise, and from evidence presented, it seems obvious that the goal for which to strive is a combination of efficiency in generation, recovery, and use of heat in the manner which is permissible with blast furnace operating principles. Since the carbon lost to solution is in the form of CO, the same as it would be if burned at the tuyeres, it is combustible and heat can be recovered from it; therefore, it is not irretrievably lost but can be returned to the furnace as blast heat to the extent which furnace operating conditions will permit such use.

The weight of CO_2 contained in the top gas in excess of the weight of CO_2 charged with the stock, must be the measurement of efficiency for heat generation and/or oxide reduction performed by coke carbon. In this measurement the weight of gas, which performs the work required to produce a ton of pig iron, is the important consideration rather than the weight of oxides reduced per ton of iron because for any given stage of oxidation the weight of oxides required for the production of a ton of iron will be the same in any furnace operation. Isolating these items from the thermal balance data we have a progressive comparison from the lean ore of the South to the rich ore of the East operation. Any blast furnace operation must be some variation of the conditions indicated in Table XI.

Efficiency in conservation and recovery of heat is just as important as efficiency in generation. These items for the three operations are compared in Table XII.

Discloses Progressive Change— In the theoretical discussion of blast furnace operating principles the distinctive nature of the shaft work, the bosh and hearth work, and how the manner and capacity of one division of work determines the productive capacity of the combined operations, have been stressed. The comparison of heat balance data shows progressive change in operating practice methods employed, from South to East, and clearly indicates the opportunity for further improvement in the productive capacity and the thermal economy which is consistent with the basic principles of blast furnace operation. This indication is the important item of the comparison rather than the obvious one alone that reduction in slag weight permits a lower fuel rate.

In each of the three operations compared the volume of heat required to produce a ton of iron varies with the character of raw materials used, and the division of

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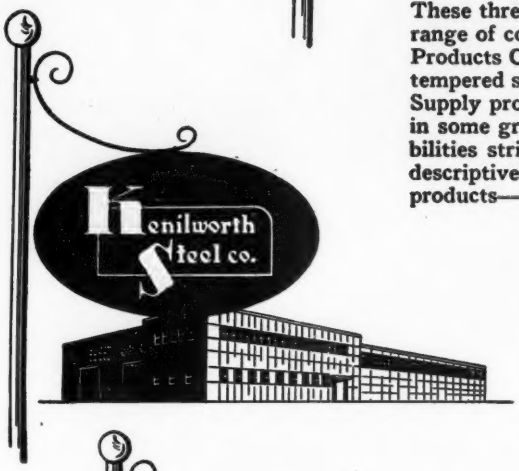

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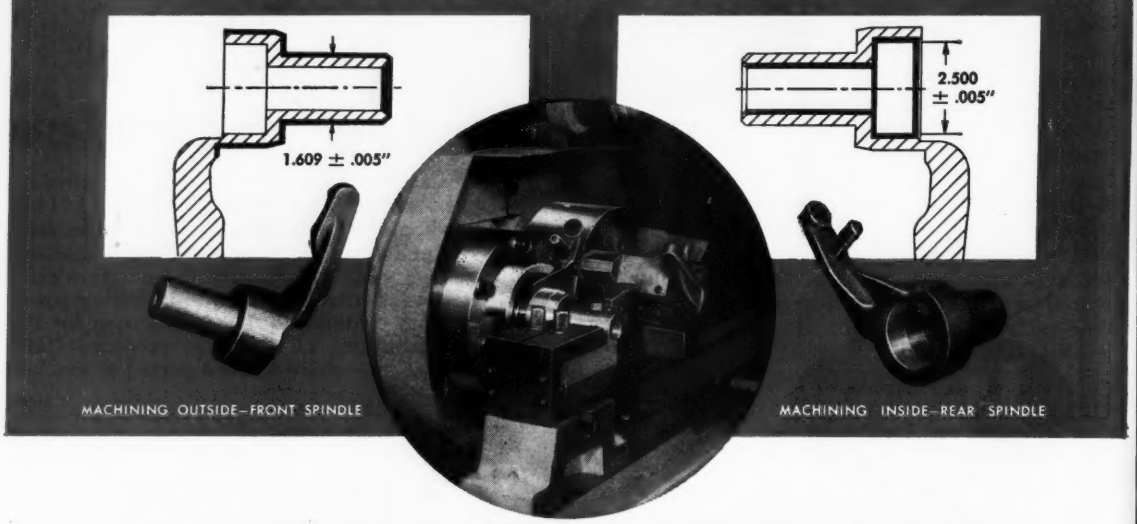

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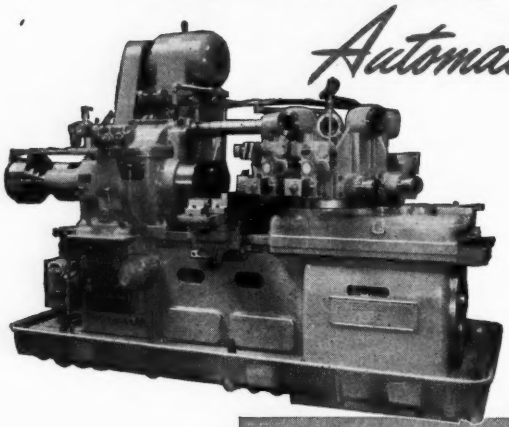
Automatic Turret Lathe



Designed to meet today's requirements for increased production of precision-machined work, the Potter & Johnston 5D-2-9" machine is equipped with a double spindle headstock and provides two tool stations on each turret face. It is now possible to perform an operation on two parts simultaneously, or an operation can be performed on one part while supplementary work is, at the same time, being done on a second. Output is far greater than the best obtainable from one single spindle unit. Initial cost, power consumption, floor space and operator attention are all much less than that required for two single spindle machines; production costs are lowered substantially.

Complete information about the 5D Automatic Turret Lathe including dimensions, specifications and design data will be sent on request. If desired, P&J tooling recommendations and time estimates based on your own sample parts or prints will gladly be furnished.

POTTER & JOHNSTON COMPANY

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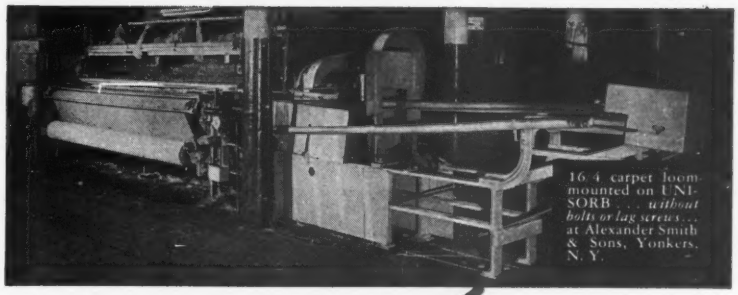
the respective amounts to their respective uses has been indicated with the thermal balance calculation. In each of the three operations a certain amount of heat must be generated to do bosh and hearth work and allow sufficient excess for delivery to the shaft for work in that area. In each of the operations a certain bosh and hearth temperature, determined by thermal requirements of slag mineral composition, must be maintained, and sufficient volume of heat must be available at the required temperatures to reduce specified amounts of silicon, manganese, and phosphorous.

Obviously, any change in the amount of heat generated or delivered to the bosh and hearth would change the necessary and desired thermal conditions, and would destroy the balance which must be maintained between shaft and bosh and hearth work in order to produce the grade of iron specified. The low blast temperature of South (957° F) is complementary to the low burden ratio and the net weight of burden delivered to the hearth. Progressive change in these items from South to East is indicative of a change in the ratio of shaft preparation capacity to bosh and hearth smelting capacity, and of the opportunity which the change offers for more efficient generation, recovery, and use of heat.

In any blast furnace operation the ratio of shaft preparation capacity to bosh and hearth smelting capacity is determined by the character of the raw materials used. If the raw materials in South and East were reversed the opportunity for heat recovery would be reversed, and if the raw materials of South were beneficiated to approximate the character of the East materials, the opportunity for heat recovery would be equal to the East operation. If South and North shafts were enlarged to the extent of equalizing their ratio of preparation to smelting capacity with East the same opportunity for heat recovery would exist as in the East operation. Fuel rates would continue to differ to the extent of differences in the volume of heat consumed for evolving volatile matter in the shaft operation and for smelting iron



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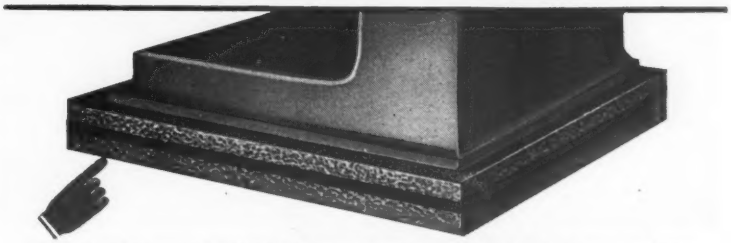

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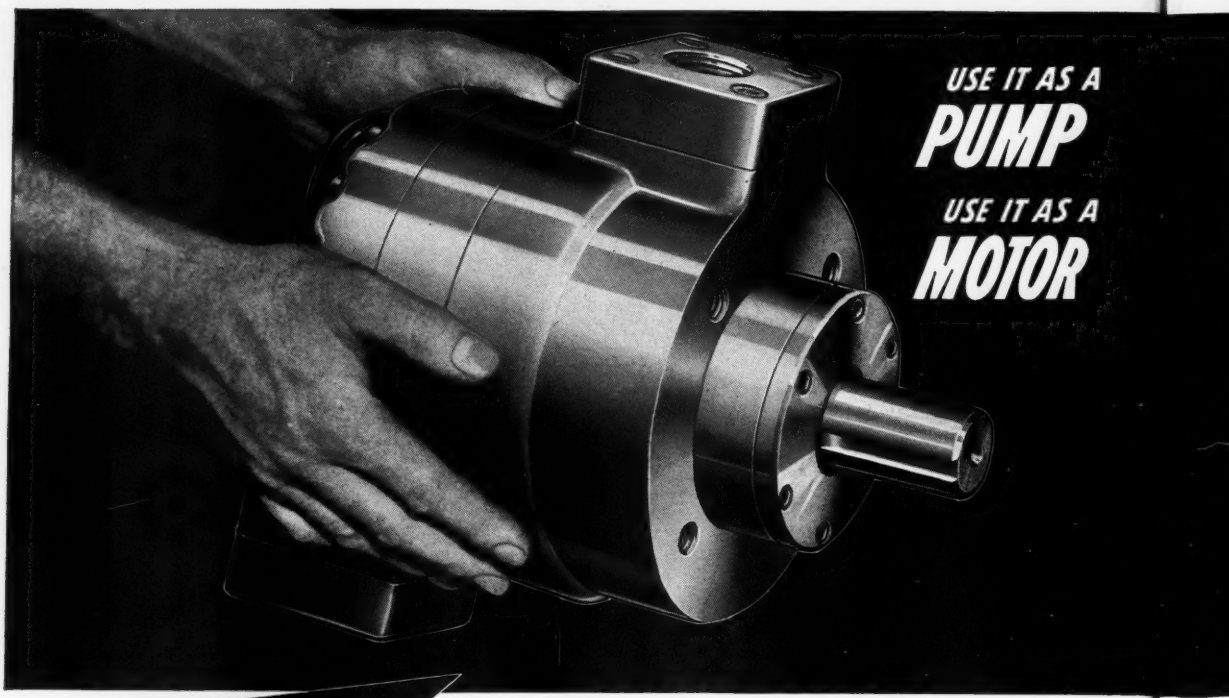

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1946 5000 psi relief, sequence and unloader valves. Hydraulically balanced . . . closer control.

5000 psi constant volume pumps . . . heavy duty, high volumetric efficiency.

1948 5000 psi variable-volume pumps for handwheel, cylinder, stem or pressure compensator control of pump volume.

1950 5000 psi surge-damping controls in both aircraft and industrial models.

5000 psi pilot-operated directional controls . . . positive action regardless of pressure.

THREE popular sizes . . . Built for 2000 psi continuous duty . . . Ready for use as either pump or motor without alterations of any kind in the unit itself . . . Clockwise or counter-clockwise operation as either pump or motor . . . 5 to 60 gpm pumping capacities . . . 380 to 4600 inch-pounds torque capacities as a motor . . . Hydraulically balanced vane action, with dual sealing edges contacting cam ring . . . Meets 16 different porting and directional requirements as either pump or motor . . . Face, flange and foot mountings . . . Rugged, space-saving compactness plus two-way efficiency!

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Dual Purpose Vane-Type Oil Hydraulic Pump

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Denison adds another important *first* to a long list of new and improved products and ideas in the oil-hydraulic field. This all-new, radially balanced hydraulic power unit works equally well as a pump or as a fluid motor! No changes of any kind have to be made in the unit itself. *Think of the advantages in being able to stock one type of unit for both pump and motor needs!*

In addition the new unit offers either clockwise or counter-clockwise rotation—for either pump or motor applications.

The unit is built in three sizes, each offering interchangeable cam rings for various volume or torque requirements — providing eight different pump or motor capacities in all.

As a pump — the 8 models have volume capacities from 5 to 60 gpm and are capable of operating continuously at 2000 psi.

As a motor—the 8 models have torque capacities from 19 to 230 inch-pounds per 100 psi and are capable of operating continuously at 2000 psi.

As a pump or a motor — the unit provides positive, constant displacement—even at low speeds. Vanes are hydraulically balanced for smoother action, longer life, less wear.

Cantilever support for the shaft and bearing assures rigid support for external shaft loads, and minimizes the effect of misalignment. Pressure-equalization reduces surge and pulsation of oil delivery to a minimum.

Simplicity is the key to the versatility, compactness and efficiency of this new pump/motor, making it a worthy addition to the long line of "firsts" by Denison.

Write for Bulletin P-5 today! *It gives full details on this unique, dual purpose HydrOILic Pump/Motor.*

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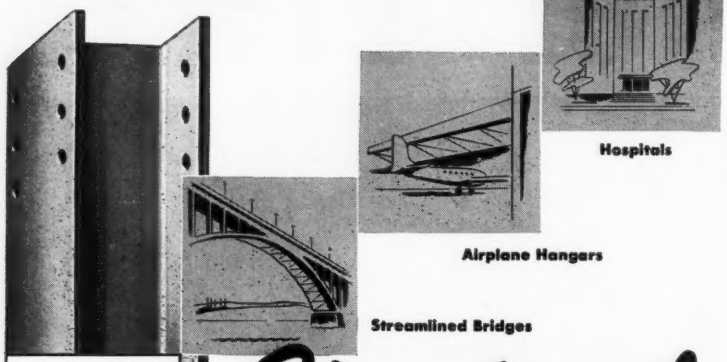

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and melting slag in the bosh and hearth operation, but the effect of the shaft operation on the recovery of heat with blast temperature would be removed.

Undergoes Change — Progressively from South to East the limiting factor in the furnace productive capacity and thermal economy is changed from the capacity of the shaft to prepare the stock to the capacity of the bosh and hearth to smelt the stock. Although the preparation capacity of the shaft, as indicated by a comparison of the thermal balance data, is determined by the character of raw materials used, and the preparation is effected by the volume of heat drained from the bosh by the gas leaving the bosh, the smelting capacity of the bosh and hearth is determined by the volume of heat which can be generated or delivered, concentrated and conserved, there. As indicated by the thermal balance data, the greater the volume of blast and volume of heat carried into the shaft, the less opportunity there will be for the conservation of sensible heat in the furnace, and for the recovery of latent heat from the gas leaving the furnace, both of which are vital to the thermal economy of operation.

Flue dust and heat losses of the South operation indicate economic limitation for such losses while a comparison of the dust and heat losses between the two North operations (Table IX, Part VI-b) indicates economic limitation to increasing iron production by accepting such losses. But the greatly reduced amount of shaft work in the East operation, made possible through beneficiation of raw materials before charging, the heavy burden and high blast temperature, indicates an opportunity for increasing the iron production and at the same time reducing the fuel rate by conserving the sensible heat in the furnace and the recovery of latent heat from the top gas.

Transfer of the limitation to the furnace productive capacity from the shaft to the bosh and hearth removes all restriction to the use of blast heat because the then reserve preparation capacity of the shaft (indicated by the East operation) can be utilized to the full

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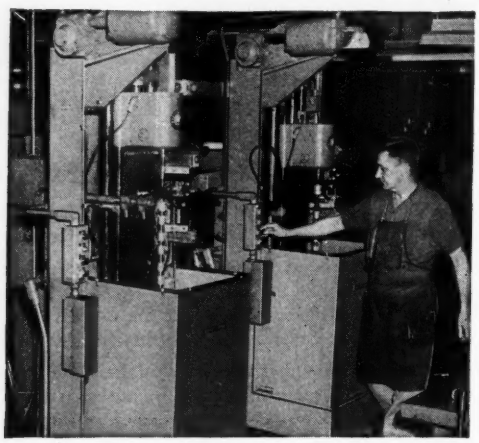

Saco-Lowell Shops, makers of outstanding textile machinery, had always experienced problems with hardened bottom front rolls.

A Westinghouse 50 KW-450 KC RF Generator, with two standard vertical scanners, helped increase line production rates by 145% with total annual savings of $18,800.00. Direct labor costs have been cut 63%. Journal bearings are now ground after hardening, producing a higher quality roll. Formerly, every shaft required straightening; now this operation has been simplified and costs are reduced 70%.

Look at the results obtained by Saco-Lowell with a Westinghouse process that can handle 432 different rolls. Examine your heat treating problems. They, too, may be reduced, clarified, or eliminated entirely.

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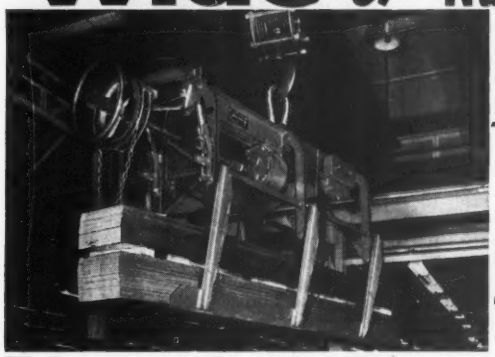
extent of any amount of blast heat which can be made available.

The East operation appears to offer the closest approach to ideal conditions for generation, recovery and use of heat which is possible with the limitations placed on the heat generation within the furnace by operating principles. All heat generated within the furnace comes from the charged materials having substance and occupying space, and they drain heat from the furnace as they are taken from it. Carbon lost to solution increases the weight of gas leaving the furnace to the extent of the weight of carbon dissolved, but if that carbon was oxidized at the tuyeres the weight of gas leaving the furnace would be increased to the extent of the weight of carbon oxidized plus the weight of air required for oxidation. Since air by weight is 23.2 per cent oxygen and 76.8 per cent nitrogen, the possible benefit from heat generation by carbon oxidation would be nullified to the extent of the additional amount of sensible and latent heat taken from the furnace by the increased weight of gas.

Advantage of Blast Heat—Heat delivered to the furnace with the blast does not have substance and therefore it is net gain to the heat generation within the furnace since it does not in any way increase the drainage of heat from the furnace. But since the heat delivered to the furnace with the blast must be consumed in the bosh and hearth, the extent to which it can be used is determined by the ratio of the shaft preparation capacity to the bosh and hearth smelting capacity. In each of the three operations compared the same amount of heat, which theoretically could have been generated within the furnace from combustion of carbon lost to solution, could have been recovered as blast heat, but at the South, and only to lesser degree at the North operation, the failure to use a higher blast temperature was caused by the inability of the respective shafts to prepare enough material to require its use. But blast temperature used at the East operation was limited only by the stove capacity. During short periods of slow blowing under operating conditions of East, the author has used 1800 and 1850° F

Wide or Narrow...



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Whether your production requires a few or many widths of sheet steel, 1 C-F Lifter, with its wide range of jaw and carrying angle adjustments will probably meet all your sheet handling requirements.

Adjustments are made by the operator in a few seconds, permitting the Lifter to shift from wide to narrow sizes almost instantly.

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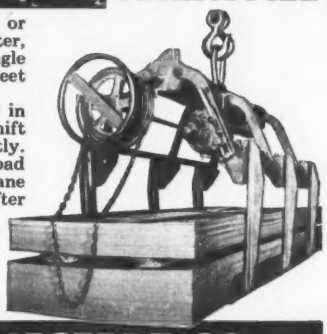

Bulletin SL-28 gives you the complete story of C-F Lifter advantages to you. Ask for it today. There's no obligation.

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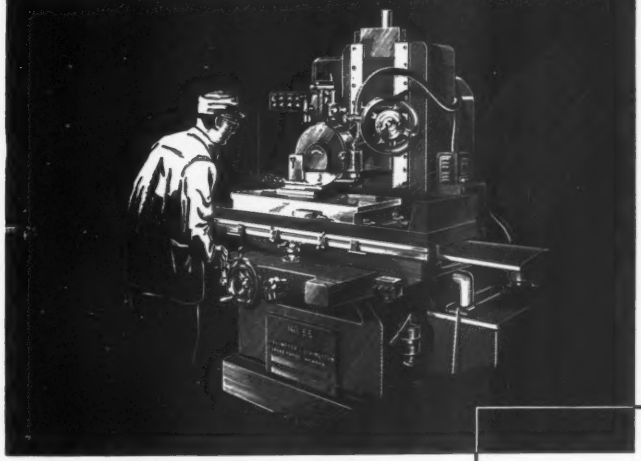

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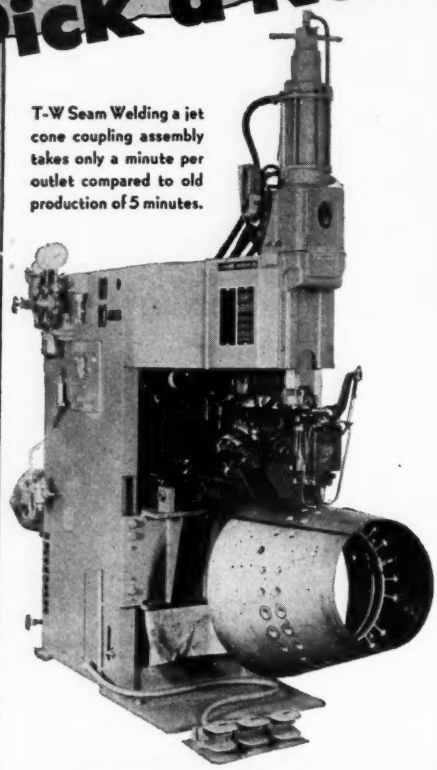

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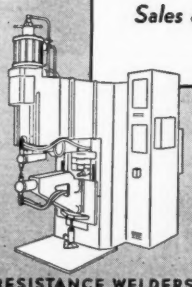

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line heat; inability to obtain more was the only apparent restriction to the use of higher temperature.

Differences in blast temperatures required by the three operations to offset the heat lost in carbon solution are shown in Table XIII.

Since raw materials used in this comparison of operations cover a range from naturally low grade to beneficiated high grade it may be said operating conditions for any blast furnace operation, anywhere, will be somewhere within the range. The extent to which natural raw materials can be made to approximate the favorable conditions of East will depend upon the nature of beneficiation required and commercial considerations which justify it.

(To be continued)

Mach 10 Speeds Reached

Air speeds ten times the velocity of sound are reached in the hypersonic wind tunnel at the U. S. Naval Ordnance Laboratory, White Oak, Md. Purpose of the tunnel is to study the characteristics of air flows at these speeds and to study basic aerodynamics for later use in missile and projectile design. Construction and operation of wind tunnels at these speeds will also be observed.

Hypersonic wind tunnel has 5-inch working section and is continuous in operation. It operates from a 3000 psi pressure reservoir of air. This air supply is throttled down to supply the wind tunnel with air at a pressure of up to 900 psi. Tunnel is exhausted by 1000 hp vacuum pumps during operation. At the higher Mach numbers the incoming air is heated to temperatures ranging up to 900°F. in order to prevent the liquefaction of air under the operating conditions. Without preheating the air tunnel would manufacture enough liquid air to obscure any air flow data obtainable, including determination of air speed.

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DUCTALLOY can be cast in intricate shapes with fine surfaces, close tolerances and less machining stock than cast steel because of its high fluidity. It is particularly valuable for pressure castings... and DUCTALLOY can be welded to steel, to gray iron and to DUCTALLOY. Write for information about this economically important new material to:

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up into a jig or fixture. Important dimensions are held to 0.0003-inch and square to 0.0006-inch per foot. After the fixture has been used it may be dismantled and its elements reused in other layouts.

Hoods Protect Tractors

Wirebound hoods are used by the Tractor Works of the International Harvester Co. at Chicago to protect export shipments of tractors against both weather and thieves. Hood fits over the engine, controls and seat and is held in place by steel strapping wires and bolts that join the hood to the front of the tractor.

Adoption of the hood resulted in savings in packing costs and reduced shipping weight. Hood provides complete protection against ordinary shipping hazards, thwarts pilferers from removing vital parts of tractors and permits stacking of considerable distributed weight on top of tractors after they are

Each hood consists of the top and four wire bound panels prefabricated to precise specifications. It is assembled by laying the top of the hood upside down on the floor and nailing to it, first each side panel and then each end panel. Panels are joined at the corners by engaging and folding the wire loop fasteners and reinforcing each corner with two steel bands about 9 inches long.

Hoods are put on after the tractors are loaded on flat cars or trucks. A steel band is stretched around the middle as further protection. Packing time per tractor is reduced about 10 per cent.

Steel Saved on Terminal Project

Savings of 20 per cent in structural steel tonnage in the construction of the North Galvez overpass were revealed by Walter E. Blessey at the spring convention of the American Society of Civil Engineers in a paper on Louisiana's first all-welded overpass.

Reporting on the construction of the new Union Passenger Terminal in New Orleans the speaker, professor of structural engineering, Tulane University, pointed out that it was found practical and economical to make use of continuity with a saving of about 20 per cent in structural carbon steel tonnage as against simple beam carbon steel construction which is

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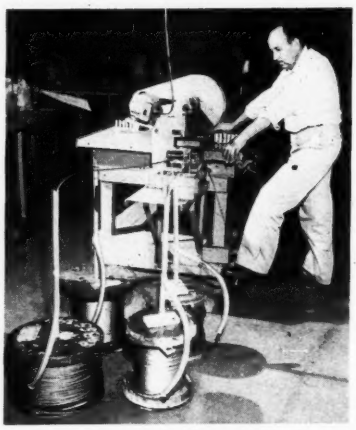

Welded Tube Feeder

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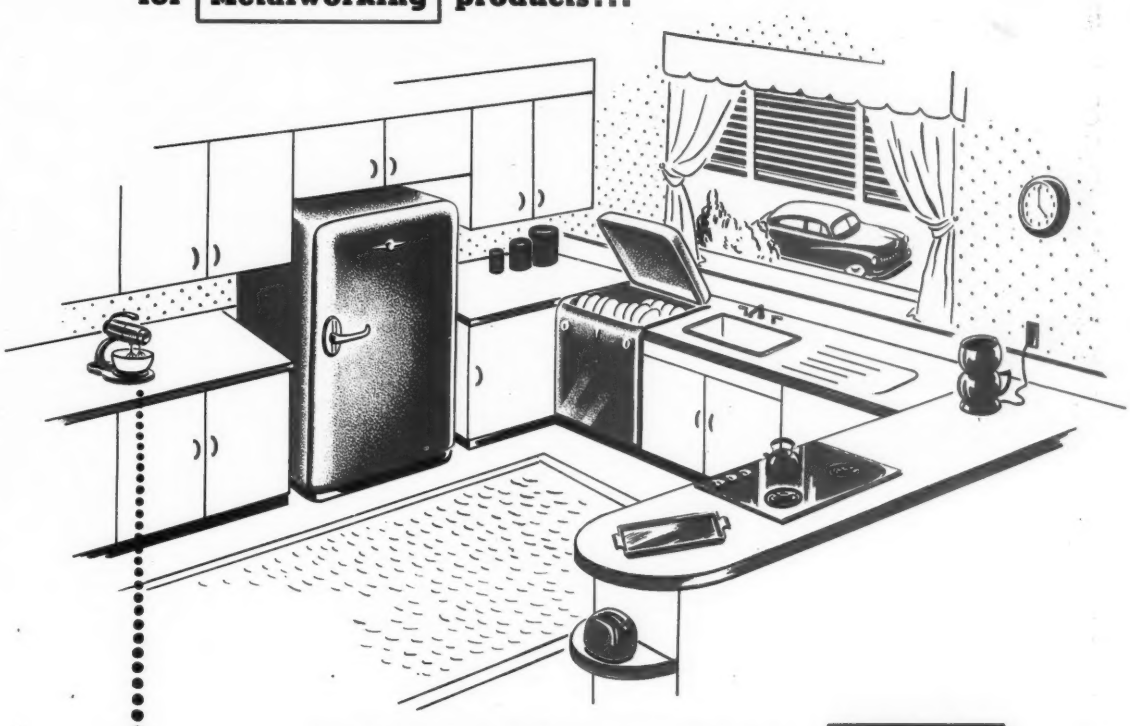

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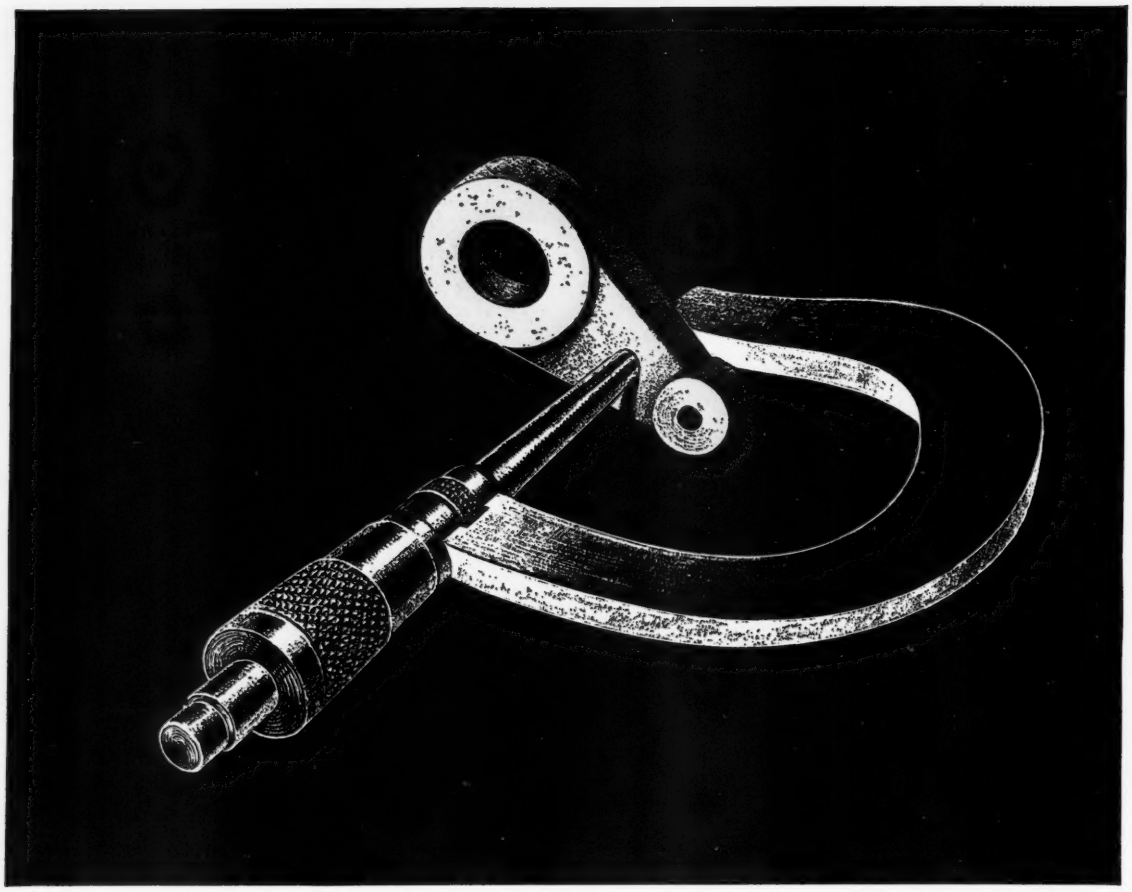

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Thin-shell molds and cores of fine-grained sands bonded with BAKELITE Phenolic Resins yield castings that need only a minimum of finishing. Surfaces are almost pattern-smooth, and tolerances are as close as .003-.005 inches per inch.

Ferrous and non-ferrous castings of such close dimensions cut costly machining and finishing operations—speed delivery of important parts. There are fewer rejects. Much metal is conserved.

It will pay you to design your products with the shell molding process in mind. Ask your foundrymen for details. Properly applied to your needs, it's a new way to meet production goals.

For information about the shell molding process and the BAKELITE Phenolic Resins developed for it, write Dept. DO-49.

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One of a series of heavy-duty, rugged trimming presses. 40 to 400 tons. Geared type and equipped with outside trimming attachment. Soundly engineered for sustained production and low maintenance.

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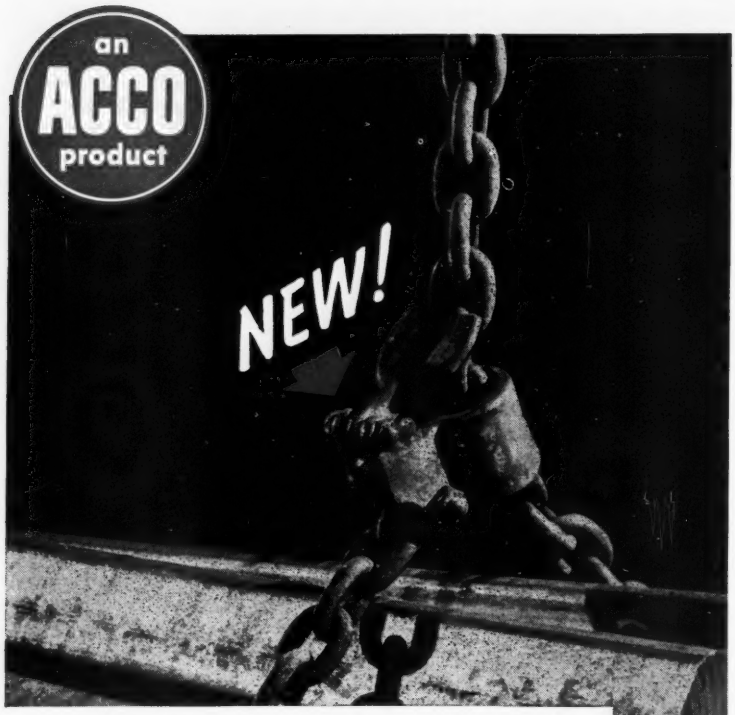
Power Presses • Since 1863 • Special Machinery **Bridgeton, New Jersey, U.S.A.**

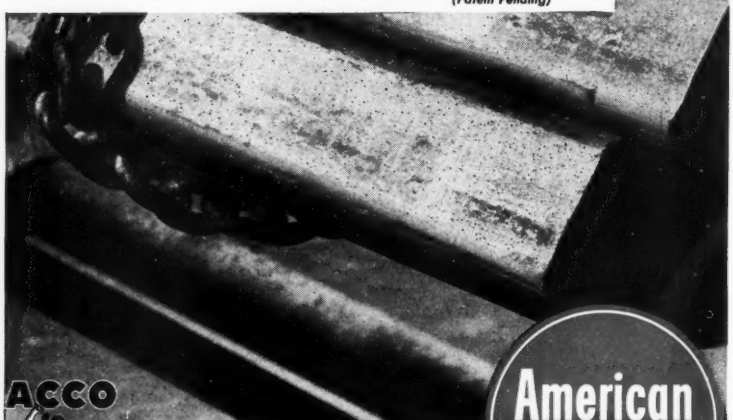


Lock 'em—and Leave 'em

● If you have a problem lifting, moving or containing bundles of bars, rods, or pipes—forget it. Get some of the new AMERICAN Bundling Chains with automatic locks. They're easy to hook up, and once you lock them, they stay locked. Yet you can unlock them with a flip of the fork. Satisfied users tell us they have made possible real savings in handling costs.

Write today for information on Bundle Locks or the 1001 other items in the complete AMERICAN Chain line.

(Patent Pending)



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usually used in the area, and to span 81 feet with rolled beam sections.

Plan includes 30 grade separation structures which will eliminate 116 out of 144 traffic-laden crossings. Total cost including work by carriers themselves on their properties, and funds from the state highway department and the Federal Bureau of Public Works, will come to $50 million.

Air Pollution Series Grows

Three new chapters of the Air Pollution Abatement Manual will be issued shortly. They are part of the project conducted by the Manufacturing Chemists' Association Inc. Chapter 4 on legislative requirements, chapter 6 on sampling procedures and measuring equipment and chapter 12, the bibliography are scheduled for publication in April.

Five of the projected 12 chapters have appeared to date. The most recent publication, chapter 5, includes a listing of maximum allowable concentrations in the atmosphere for 144 different chemical substances. The author, E. M. Adams of the Dow Chemical Co., states that these have been effective in preventing harmful exposures of workmen within the plant but should not be applied to general air pollution problems except when duration and frequency of exposures are appropriate.

Other MCA publications include manuals on container handling and unloading and safety data sheets relating to the properties, handling and health hazards of individual chemicals. A price list will be sent on request. Remittance should accompany any orders addressed to the association, Woodward Bldg., 15th and H Sts., Washington 5.

New Coolant Announced

With field tests completed a new coolant is announced by Master Chemical Corp., Toledo, O. This cutting fluid was originally conceived to combat the problem of bacteria growth and to enable the fluid to stand up for a period of time longer than that of standard cutting fluids.

Results of tests show Trim holds up for a considerable period of

2 SPINDLES OR 200—WORK OUT ANY SET-UP TO SUIT YOUR OWN NEED with DELTA DRILL PRESSES

For simultaneous performance of one operation or sequence-performance of such operations as drilling, countersinking and boring, Delta drill presses have the flexibility that makes any set-up not merely possible, but easy.

Low in cost, easy to maintain, readily portable, these drill presses are good examples of fine engineering, rugged construction and compact design—an ideal combination that has made them exceedingly popular.

Patented spindle drive and mounting assures accuracy—and many useful attachments make possible an unusually wide variety of machining operations.

Two models: 14 inch and 17 inch.

DELTA POWER TOOLS Another Rockwell Product

DESIGN YOUR OWN MULTIPLE DRILL SET-UP WITH DELTA SECTIONAL TABLES

Sectional tables consist of center sections to be bolted together between end sections, forming a smooth, sturdy working surface ideal for easy movement of the work through a series of operations.

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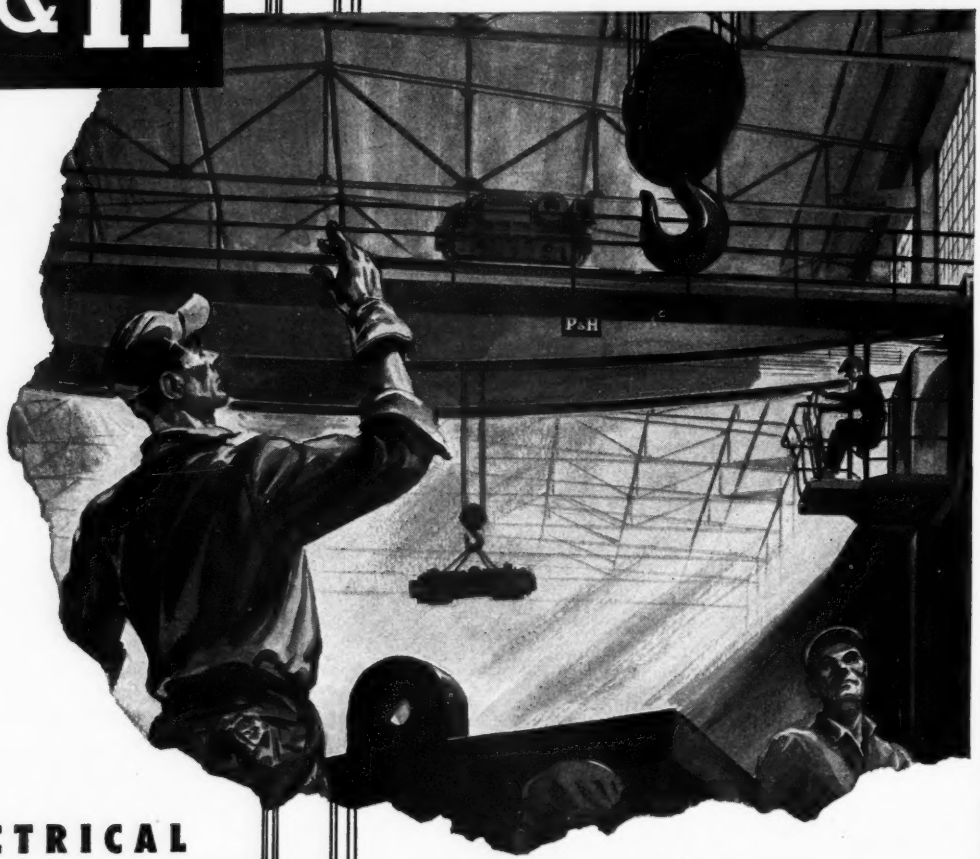
OVERHEAD CRANES



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FOR CRANE SERVICE

P&H Magnetorque* Control is the greatest crane improvement in 20 years. Get the facts about it!

***T. M. of Harnischfeger Corporation for electro-magnetic type brake.**

Lifting and lowering heavy loads is the severe type of service that requires special motors, special controls and other electrical equipment designed for this specific purpose. P&H knows this through long experience. That's why we build our own and recommend it to you. With P&H electrical equipment, you may be sure your crane is a balanced unit, perfectly coordinated, job engineered in every detail for your requirements. Wise crane buyers know this and specify P&H electrical equipment on their overhead cranes. It means better service, too, with no buck-passing between the crane builder and outside suppliers. P&H — America's leading crane builder — takes the *entire responsibility!*

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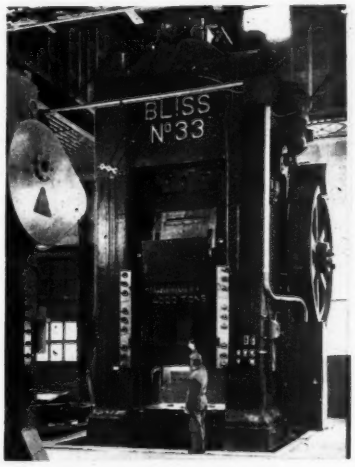
time without breaking down. It gets rid of the other objections which accompany bacteria growth, and shows good qualities of lubricity and coolant ability.

Midget Helicopter Developed

A helicopter powered by small jet engines is being developed under supervision of the Army Ordnance Corps. Designed so it can be dropped from larger planes, the small ship can be unpacked by two men and put in the air in approximately 20 minutes.

Designed for air evacuation, transport, supply and observation it weighs less than 300 pounds, is 6 feet high and can be collapsed into a 5 x 5 x 14-foot container. It will carry two men side by side, or tandem in twin external litter carriers.

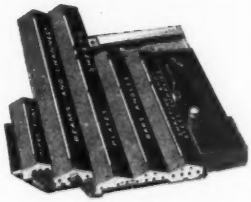
Designated the XH-26 the aircraft is basically a one man ship powered by two 16-pound pulse jet engines, one on each end of the rotor blades. Loaded for flight the plane will weigh about 700 pounds. Top speed is 80 mph and flight time is 1½ hours without refueling. Developed by the American Helicopter Co., Los Angeles, the plane can burn gasoline, kerosene or diesel fuel oil.



Regal Juggernaut

Built at E. W. Bliss Co.'s Toledo, O., plant, this 4000-ton knuckle joint press will be used by Regal Ware Inc., Kewaskum, Wis., for coining and extruding steel artillery shells. Six-station ratchet dial feed is 59 inches diameter. Bed area measures 60 x 70 inches

HOW TO EXPAND YOUR PLANT WITHOUT ANY CONSTRUCTION



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In addition, Holliday provides complete Engineering and Metallurgical facilities to assist you. Benefit by our 96 years of experience—investigate Holliday services today!

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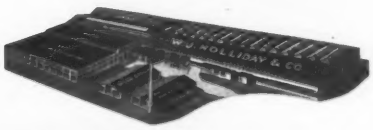

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The Speed Steels—Speed Alloy hot rolled alloy plate, Speed Case (X1515) plate and Speed Treat (X1545) plate are a development of Holliday. Distributed by steel warehouses in key cities.

CALENDAR OF MEETINGS

March 17-21, American Society of Tool Engineers: Annual meeting and biennial industrial exposition, International Amphitheater, Chicago. Society address: 10700 Puritan Ave., Detroit. Secretary: Harry Conrad.

March 18-19, Steel Founders' Society of America: Annual meeting, Edgewater Beach Hotel, Chicago. Society address: 920 Midland Bldg., Cleveland 15. Secretary: F. Kermit Donaldson.

March 18-19, Export Managers Club of New York: Annual meeting, Hotel Statler, New York. Address: Two Lafayette St., New York 7.

March 20-21, Pressed Metal Institute: Spring technical meeting, Hotel Carter, Cleveland. Institute address: 2860 E. 130th St., Cleveland 20. Manager: Orrin B. Werntz.

March 21, Materials Handling Institute: Edgewater Beach Hotel, Chicago. Institute address: 731-732 DuPont Circle Bldg., Washington 6. Managing director: R. Kennedy Hanson.

March 22-April 6, Chicago International Trade Fair: Navy Pier, Chicago. Executive director: John N. Gage, Col., U.S.A., Ret. Address: Merchandise Mart, Chicago.

March 23-27, Buffalo; March 30-April 3, Milwaukee—American Chemical Society: Annual spring meeting. Society address: 1155 16th St. NW, Washington 6. Executive secretary: Alden H. Emery.

March 24-25, American Hot Dip Galvanizers Association Inc.: Annual meeting, Hotel Drake, Chicago. Association address: 2311 First National Bank Bldg., Pittsburgh 22. Assistant secretary: Stuart J. Swensson Jr.

March 24-26, American Society of Mechanical Engineers: Spring meeting, University of Washington, Seattle. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

March 24-28, National Association of Power Engineers Inc.: National power conference and exhibit, Hotel Sherman, Chicago. Association address: 176 W. Adams St., Chicago. Secretary: A. F. Thompson.

March 24-28, National Association of Manufacturers: Institute of Industrial Relations, Boca Raton Club, Boca Raton, Fla. Association address: 14 W. 49th St., New York 20. Institute director: Sibyl S. Patterson.

March 30-31, Packaging Machinery Manufacturers Institute: Semi-annual spring meeting, Hotel Dennis, Atlantic City, N. J. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Stratton.

March 31-April 2, International Acetylene Association: Annual spring meeting, Hotel Claypool, Indianapolis. Association address: 30 E. 42nd St., New York 17. Secretary: H. F. Reinhard.

March 31-April 2, American Institute of Mining & Metallurgical Engineers: National open hearth conference, William Penn Hotel, Pittsburgh. Institute address: 29 W. 39th St., New York 18. Secretary: Ernest Kirkendall.

April 1-3, Steel Shipping Container Institute: Annual meeting, Hotel Biltmore, Palm Beach, Fla. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

April 1-4, American Management Association: National packaging exposition and conference, Atlantic City Auditorium, Atlantic City, N. J. Association address: 330 W. 42nd St., New York. Secretary: James O. Rice.

April 3-4, Instrument Society of America: Annual steel instrumentation symposium, Hotel Roosevelt, Pittsburgh. Society address: 921 Ridge Ave., Pittsburgh 12. Secretary: Richard Rimbach.

April 4-5, National Association of Cost Accountants: Regional cost conference, Indianapolis. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnarson.

April 7-8, American Management Association: Production conference, Hotel Statler, New York. Association address: 330 W. 42nd St., New York. Secretary: James O. Rice.

April 7-9, American Society of Lubrication Engineers: Annual meeting, Hotel Statler, Cleveland. Society address: 343 S. Dearborn St., Chicago 4. Secretary: W. F. Leonard.

April 9, Cutting Tool Manufacturers Association: Spring meeting, Hotel Cleveland, Cleveland. Association address: 416 Penobscot Bldg., Detroit. Secretary: Emil Gairing.

April 9-11, Society of the Plastics Industry Inc.: Annual technical session, Reinforced Plastics Division, Edgewater Beach Hotel, Chicago. Society address: 67 W. 44th St., New York 18. Secretary: William T. Cruse.

April 16-18, American Institute of Electrical Engineers & American Welding Society, Detroit Section: Annual welding conference, Rackham Memorial Bldg., Detroit. Conference publicity: J. S. Francis, Consumers Power Co., Jackson, Mich.

April 17-18, Caster & Floor Truck Manufacturers Association: Spring meeting, Hotel Hollenden, Cleveland. Association address: 7 W. Madison St., Chicago 2. Secretary: Harry P. Dolan.

April 17-18, American Machine Tool Distributors Association: Annual spring meeting, Edgewater Beach Hotel, Chicago. Association address: 1900 Arch St., Philadelphia. Executive secretary: Thomas A. Fernley Jr.

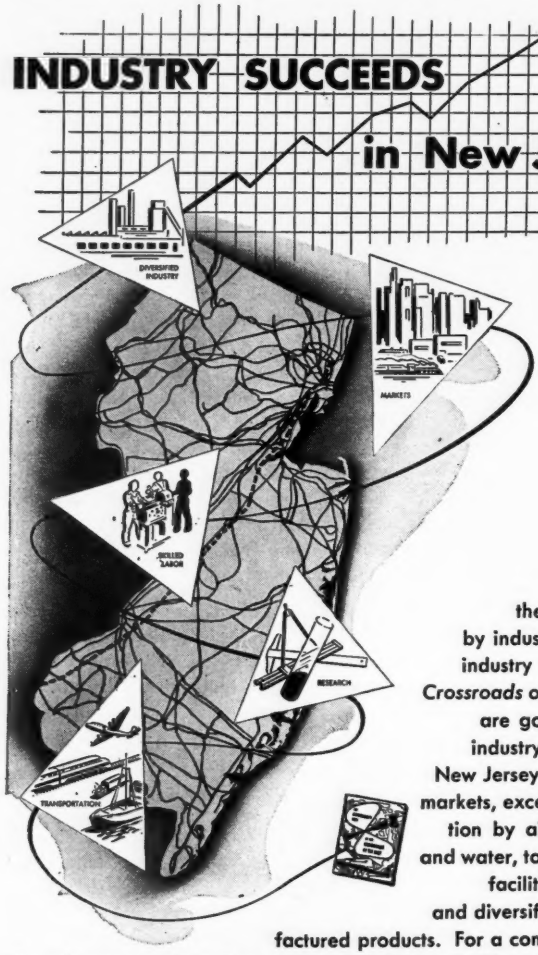
April 18-19, Lead Industries Association: Annual meeting, Hotel Drake, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 18-19, National Association of Cost Accountants: Regional cost conference, Atlanta. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnarson.

April 18-21, Grinding Wheel Institute: Spring meeting, The Homestead, Hot Springs, Va. Institute address: 2130 Keith Bldg., Cleveland 15. Secretary: Frank G. Gustafson.

April 20-24, National Industrial Service Association: Annual convention, Hotel Conrad Hilton, Chicago. Association address: 818

(*continued on p. 122*)



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One of the TOCCO Induction Melting Furnaces used at Arwood Precision Casting Co. Note TOCCO control station in background.

● Engineers at Arwood Precision Casting Co. use TOCCO Induction Melting Furnaces for melting and remelting quality steel. Other companies have found TOCCO equally adaptable for melting non-ferrous metals. No wonder! *Look at the advantages:*

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If any of these advantages suggest economies in your operations write for full details—no obligation, of course.

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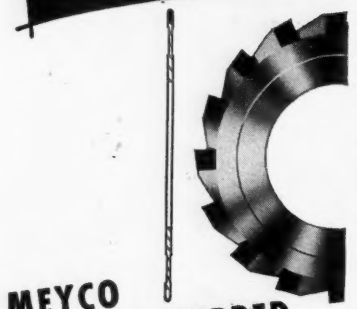
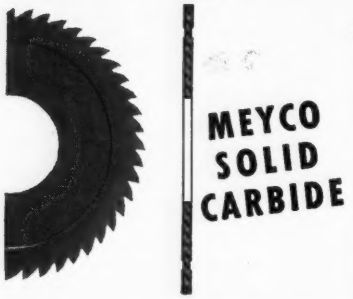


MEYCO CARBIDE TIPPED



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(*concluded from p. 120*)

Olive St., St. Louis 1. Convention publicity: McGiveran-Child Co., 162 N. Clinton St., Chicago 6.

April 21-22, American Coke & Coal Chemicals Institute: Eastern regional meeting, Westchester Country Club, Rye, N. Y. Institute address: 711 14th St. NW, Washington. Executive secretary: Samual Weiss.

April 21-22, American Zinc Institute Inc.: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary: Ernest V. Gent.

April 21-24, Society of Automotive Engineers: National aeronautic and aircraft engineering display, Hotel Statler, New York. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

April 23-25, American Institute of Steel Construction Inc.: Spring engineering conference, Hotel Commodore, New York. Institute address: 101 Park Ave., New York 17. Executive vice president: L. Abbett Post.

April 27-May 1, American Ceramic Society: Annual meeting, William Penn Hotel, Pittsburgh. Society address: 2525 N. High St., Columbus, O. Secretary: Charles S. Pearce.

April 28-29, Association of Iron & Steel Engineers: Spring conference, Netherland Plaza Hotel, Cincinnati. Association address: 1010 Empire Bldg., Pittsburgh 22. Managing director: T. V. Ess.

April 23-30, Chamber of Commerce of the U. S.: Annual meeting, Chamber of Commerce Bldg., 1615 H St. NW, Washington 6. Executive vice president: Arch N. Booth.

April 28-May 3, Concrete Reinforcing Steel Institute: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 38 S. Dearborn St., Chicago 3. Secretary: H. C. Delzell.

April 29-30, Metal Powder Association: Annual spring meeting, Hotel Drake, Chicago. Association address: 420 Lexington Ave., New York 17. Acting secretary: Robert L. Ziegfeld.

April 30-May 4, Industrial Diamond Association of America Inc.: Annual meeting, Princess Hotel, Bermuda. Association address: 124 E. 40th St., New York. Secretary: Athos D. Leveridge.

May 1-7, American Foundrymen's Society: Annual meeting, Convention Hall, Atlantic City, N. J. Society address: 616 S. Michigan Ave., Chicago. Secretary: W. W. Maloney.

May 1-7, Annual International Foundry Congress & Exposition: Convention Hall, Atlantic City, N. J. Host: American Foundrymen's Society.

May 2-3, Industrial Fasteners Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 3648 Euclid Ave., Cleveland. Secretary: James D. Eggers.

May 4-8, Electrochemical Society Inc.: Semiannual meeting, Benjamin Franklin Hotel, Philadelphia. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

May 5-7, Automotive Engine Rebuilders Association: Spring meeting, Hotel Plaza, San Antonio, Tex. Association address: 419 N. Capitol Ave., Indianapolis, Ind. Executive vice president: R. G. Patterson.

May 5-7, American Mining Congress: Annual spring meeting, Netherland Plaza Hotel, Cincinnati. Congress address: 1102 Ring Bldg., Washington 6. Secretary: Julian D. Conover.

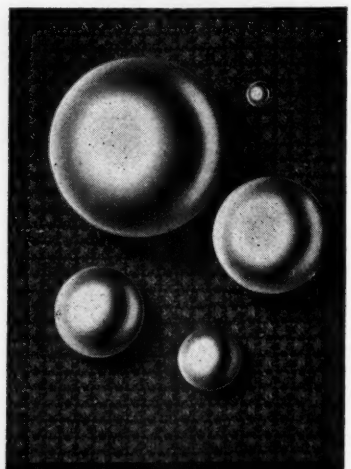
May 6-8, National Highway Users' Conference: Highway transportation congress, Washington. Conference address: National Press Bldg., Washington 4. Director: Arthur C. Butler.

May 6-9, Scientific Apparatus Makers Association of America: Annual meeting, Edgewater Beach Hotel, Chicago. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

May 7-10, National Screw Machine Products Association: Annual spring meeting, Hotel Chase, St. Louis. Association address: 2860 E. 130th St., Cleveland. Executive secretary: Orrin B. Werntz.

May 8-9, The Wire Association: Spring meeting, William Penn Hotel, Pittsburgh. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

a metal ball PROBLEM?



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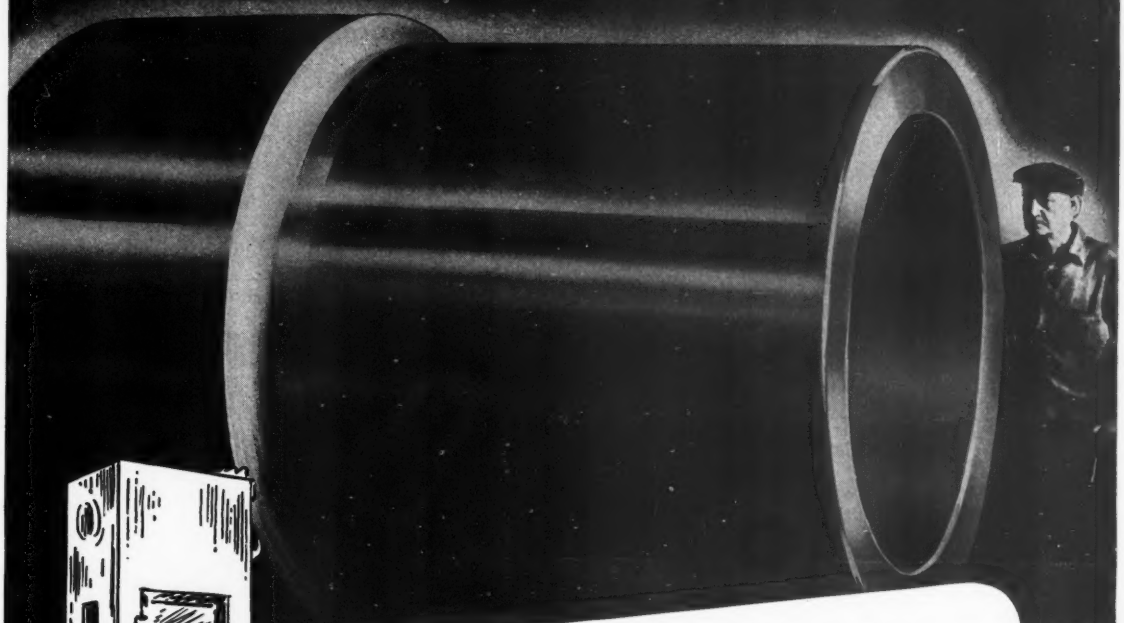

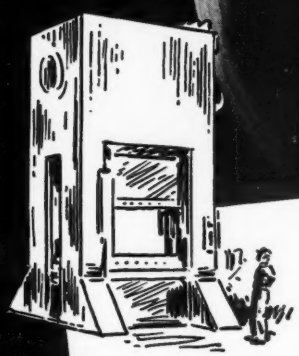

Press cylinder produced by Midvale for 11,000 ton capacity press for large steel plant in southwest.
DIMENSIONS:
Length outside: 7 ft., 10¾ in.
Length inside: 6 ft., 11⅞ in.
Outside Diameter: 66 in. (± 1/32 in.)
Inside Diameter: 51½ in. (± 1/32 in.)

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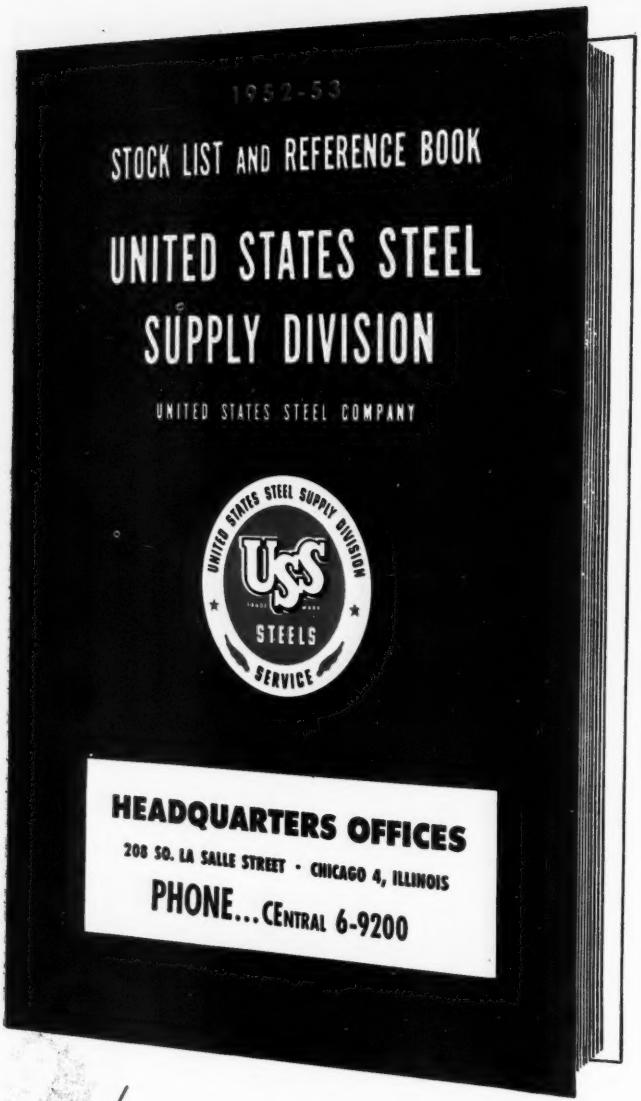

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United States Steel Supply
208 S. La Salle Street, Chicago 4, Illinois

Gentlemen: Please send me, without obligation, a copy of your 1952-53 Stock List.

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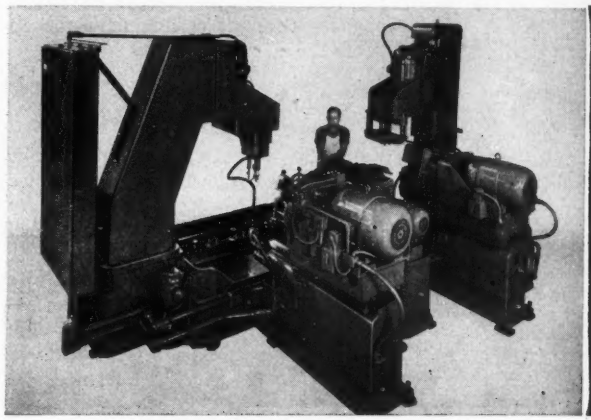
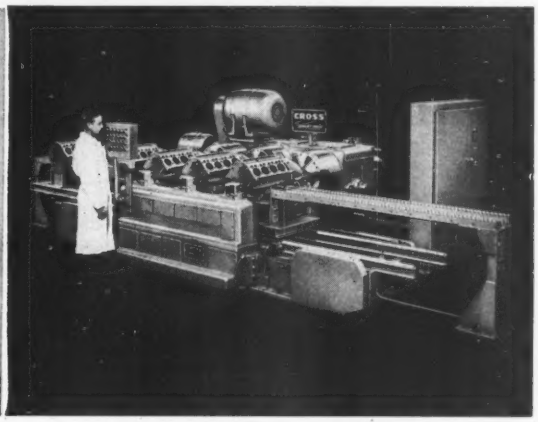
UNITED STATES STEEL

New Products and Equipment



PROCESSING TANK SUSPENSION SUPPORTS
. . . five-way drilling machine has individual lead-screw tapping



BORING CYLINDER BLOCK ASSEMBLIES
. . . one unskilled operator produces 81 pieces per hour

Five-Way Hydraulic Drill

USE REPLY CARD—CIRCLE No. 1

Special machine made by Buhr Machine Tool Co., Ann Arbor, Mich., is designed for processing suspension supports for Army tanks. Drill is a five-way hydraulic-feed machine with individual lead-screw tapping. Its holding fixture, mounted on a carriage, is transferred manually from station to station as eleven drilling and chamfering operations and nine tapping operations are performed. At each station, the fixture is interlocked electrically with the machining cycle. Whenever fixture is improperly positioned, forward cycle cannot be started.

Machine ways are tool steel, hardened and ground, and automatically lubricated. All hydraulic and electric installations conform with J.I.C. standards.

Filter Has Self-Cleaning Web

USE REPLY CARD—CIRCLE No. 2

Self-cleaning, continuously rotating filter web is featured on an automatic Houdaille web filter, made by Honan-Crane Corp., Lebanon, Ind. Use of the complete filter bed enables this small, compact model to handle large volumes of coolant. Endless web-type belt uses same filtering medium many times.

Designed to serve individual machine tools or small central coolant systems, the filter is suited for machines wherever mineral or soluble oil coolant is used. Speed of the web can be regulated, depending on the varying volume of coolant to flow. Degree of filtration also can be varied to suit nature and quantity of coolant contamination. Maintenance is reduced to periodic disposal of chip accumulation. Units are available in capacities from 40 to 500 gpm.

Electronic Pilot Relay

USE REPLY CARD—CIRCLE No. 3

Electronic pilot relay with current flow of 0.00002-amp, capable of controlling large power values, is announced by Haledy Electronics Co., 57 William St., New York, N. Y. Triode tube is made without heater filament.

Starting without warm-up, the relay operates over any input resistance from a dead short to 10 meghoms and unlimited-length leads. Current amplification reaches 2½ million. In operation, the unit consumes 2 w, on an 11-v, 60-cycle line source.

REPLY CARDS

on page 139 will bring you more information on any new products and equipment in this section.

Tool Bores, Faces Automatically

USE REPLY CARD—CIRCLE No. 4

Cross Co., Detroit 7, Mich., announces a Transfer-matic, developed for boring and facing flywheel housings and cylinder block assemblies. The machine is sufficiently uncomplicated to permit one unskilled operator to produce 81 pieces per hour at 100 per cent efficiency. It bores transmission holes and faces the transmission face concentric and square with the crankshaft bore. Preset tools facilitate changing operations, minimizing downtime. Automatic features incorporated include lubricating, automatic power-operated locating and clamping and automatic balancing mechanisms for the cross-facing slides. Machine has hydraulic feeds for boring and facing, is constructed to J.I.C. standards.

Truck Panel Made Standard

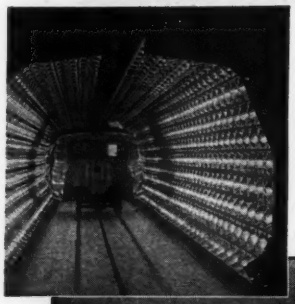
USE REPLY CARD—CIRCLE No. 5

Gas-powered Carloader and Clipper model fork trucks made by Clark Equipment Co., Battle Creek, Mich., have redesigned instrument panels included as standard equipment. Panel is attached to the steering column directly in front of the driver to insure visibility during all phases of operation. It includes fuel, temperature and oil-pressure gages, ignition switch, brake control fuses and starter button. Space is also made for in-

For Baking • Drying • Degreasing • Dehydrating • Preheating

FOSTORIA INFRA-RED

MOST EFFICIENT OF ALL INDUSTRIAL OVENS

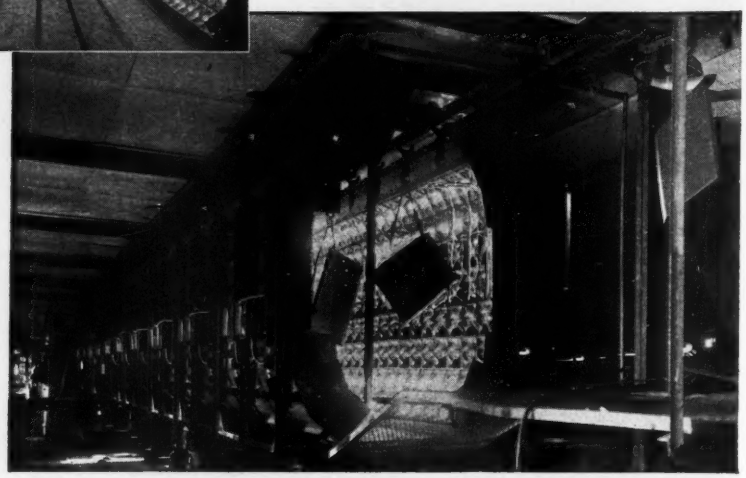


Cuts Unit Costs
Substantially reduces all operating cost factors. Lowest "per piece" production expense.

Speeds Production
Fastest of all heating methods. Ideal for conveyorized operations.

Saves Floor Space
Smaller oven because of high efficiency. Also easily suspended from ceiling to save floor space.

Saves Manhours
Easily turns out more pieces per day with fewer people.



3 FOSTORIA OVENS AT INTERNATIONAL HARVESTER COMPANY

Picture above shows 74 ft. ceiling-mounted oven used by International for baking paints on hoods, fenders and other sheet metal parts for military trucks. Average baking time to government specifications is 30 minutes with connected load of approximately 150 KW. Inset picture at top shows 37 ft. oven used for baking various color finishes on International's line of civilian, sleeper and military truck cabs. Baking time to government specifications is 30 minutes. A third oven 29 ft. long, not shown, is used for touch-up finish baking on completed military trucks.

Throughout industry, Fostoria "Golden Wall" Evenray Infra-red has become the new high standard of efficiency for finish baking and other heating operations. This higher efficiency over any other Infra-red equipment or heating method is obtained by such vital and exclusive Fostoria features as gold plated oven walls and Evenray reflectors. Fostoria ovens give greater productive use of energy than any other equipment — lowest "per unit" production cost and uniform quality. May we show you why many thousands of plants have switched to Fostoria Infra-red?

WRITE FOR COMPLETE FACTS

Send for this brochure of technical facts on Infra-red with case histories of many installations. Tell us about your particular problem.

THE FOSTORIA PRESSED STEEL CORPORATION

ONLY WITH FOSTORIA GOLDEN WALL EVENRAY INFRA-RED OVENS

- Highest productive utilization of energy—lowest energy loss.
- Uniform heat distribution to all product surfaces.
- Instantaneous heat, instantly controlled — no stand-by time — no overheating.
- Lowest unit production cost and finest, most durable finishes.

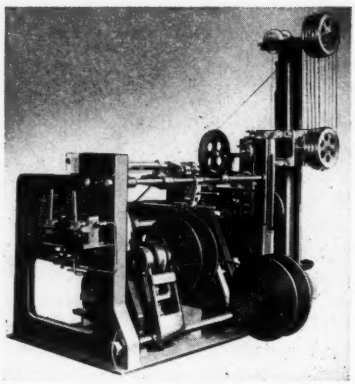
Listed by Underwriters'

stallation of a Hobbs hour meter as optional equipment when required. For protection, a metal box houses the entire assembly and all connecting wires to the panel box pass through a channel attached to the mounting plate.

Cable Take-up—Sans Gears

USE REPLY CARD—CIRCLE No. 6

Wire and cable take-up unit that operates without gears or clutches is offered by Standard Machinery Co., Mystic, Conn. Machine's reel is driven by double V-belts. A brake stops the unit automatically as it is disengaged. Traverse mechanism is air-actuated, positive in operation. Reels are shifted in and



. . . reduced vibration is one result

out of engagement by air pressure and reel is moved to floor level to overcome danger of damage by dropping.

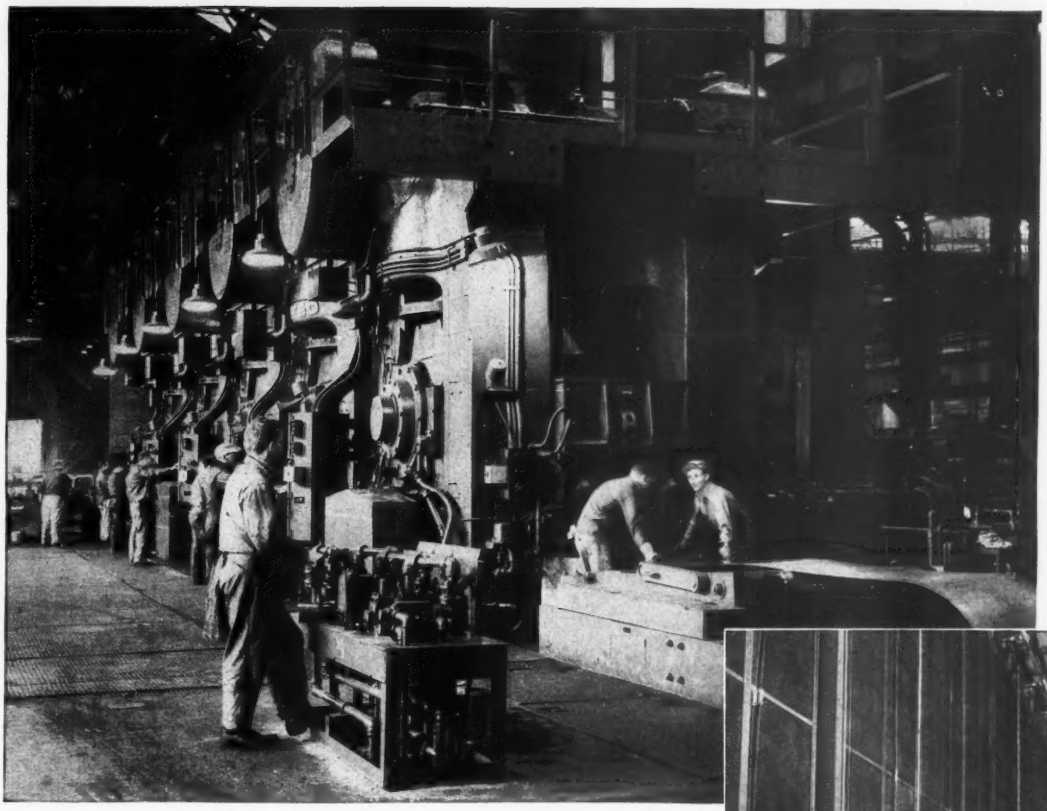
Choice of speed change methods for constant tension control is provided, as well as an efficient dancer control column. Machine is built in sizes to take reels from 6 to 36 inches and operate with reduced noise and vibration. Reel arbor is removable and adaptation can be made for coiling heads if necessary.

Hydraulic Straightening Press

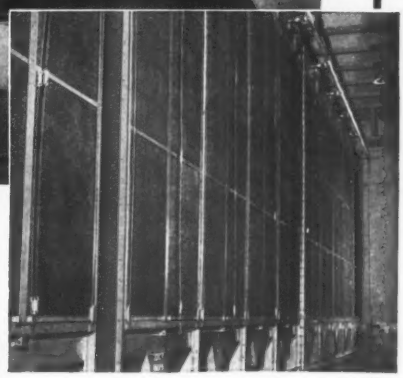
USE REPLY CARD—CIRCLE No. 7

Precision hydraulic straightening press, designed for sensitive work, is offered by Hufford Machine Works Inc., El Segundo, Calif. Safety feature is an automatic stroke limiter that protects against overbending. Manual control is exerted by the vertical shipper rod attached to the side of the frame and linked to a hand lever.

today's best buy is better air!



▲ *Tandem cold strip mill at Weirton Steel Company.*



ELECTRO-MATIC ▶ *installation at Weirton.*

super-clean air and HIGH PRODUCTION SCHEDULES!

ELECTRO-MATIC Filters Protect Vital Mill Motors . . . reduce shut-downs and maintenance.

Today, *super-clean* air supplied by AAF Electro-Matic* precipitators protects thousands of mill motors against dust damage . . . and the resulting shut-downs that mean lost tonnage.

Here are the reasons why so many steel companies have installed Electro-Matics for mill motor ventilation. It is the *only* automatic, self-cleaning electronic precipitator and maintains highest cleaning efficiency over a wide range of particle sizes . . . from smoke to the largest air-borne material. Due to Electro-Matic's specially designed collector plates the filter curtain is non-clogging and insures uniform volumes of *super-clean* air. Also, exclusive self-cleaning feature reduces servicing to routine maintenance.

The Electro-Matic is made in standardized self-contained sections, which are easily installed in various arrangements to meet any air volume requirements. These may be equipped with oil clarifiers which continuously clean the Viscosine and simplify sludge removal.

For full story on *super-clean* air protection for mill motors call your nearby AAF representative or write to us for Engineering Bulletin No. 250 F.

***ELECTRO-MATIC** *Automatic Electronic Precipitator.*

AAF **American Air Filter**
COMPANY, INC.

443 Central Avenue, Louisville 8, Kentucky • In Canada: Darling Bros., Ltd., Montreal, P. Q.

personal contact . .

a sure way to see and sell Important Buyers in the Steel Industry

There is no better way of selling the important buyers of the giant steel mill market than through *Personal Contact.* The big 1952 Iron and Steel Exposition provides the opportunity this year to see and sell—in person—the men of this fast moving industry—at a time when they are eager to learn of new and improved ideas, products, supplies or services.

For booth space . . . get in touch with us at once as there are a few good locations still remaining. They are going fast, so write, 'phone or wire today.

ASSOCIATION of IRON and STEEL ENGINEERS
1010 EMPIRE BUILDING • PITTSBURGH 22, PA.

EXHIBIT AT THE

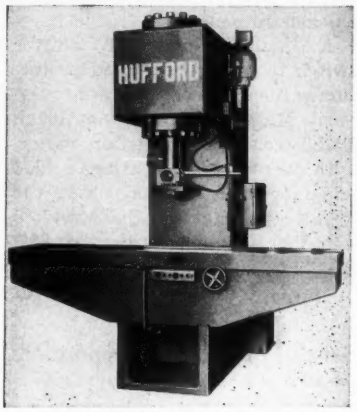
1952 IRON and STEEL EXPOSITION

CLEVELAND
Public Auditorium

Sept. 30, Oct. 1, 2 and 3

Shifting this rod increases or decreases fluid volume in proportion to lever displacement.

Special attachment is included to accomplish rapid stroke alternation. Panel micrometer settings are made by a handwheel connection to the screw. An automatic counter indicates ram extension to within 0.010-inch from starting position; dial gage shows applied force from 0 to 150 tons. The model 85 has 150-ton capacity; pressing speed from 0 to 48 inches per minute, retracting speed of 0 to 65 inches per minute.



. . . safety feature prevents overbending

Bench Checks Light Switches

USE REPLY CARD—CIRCLE No. 8

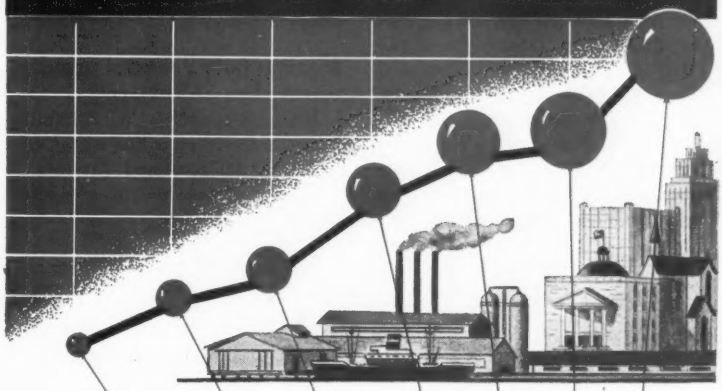
J. N. Fauver Co. Inc., 49 W. Hancock Ave., Detroit 1, Mich., announces its electro-hydraulic check bench, developed for processing brake light switches. Tester applies 2500 psi hydraulic pressure to the tested switch to assure seating of the metallic pressure diaphragm. It applies 130 psi hydraulic pressure to assure that switching element makes contact between 60 and 100 psi. It insures that the switch element, during contact time in test, carries the same amperage as two brake light bulbs on 6-v battery circuit. Bench tests ten parts per minute.

Enclosed Fan-Cooled Motors

USE REPLY CARD—CIRCLE No. 9

Series of totally enclosed and fan-cooled motors in sizes from ¼ to 3-hp is offered by Kingston Conley Division, Hoover Co., N. Plainfield, N. J. Smaller ratings

INFLATION vs. FIRE PROTECTION



"Automatic" Sprinkler has the answer

Let's face it! Inflation is a continuing process in today's economy. It makes little difference to a property owner whether it is the result of planning, bungling or world unrest. The fact remains that higher and higher replacement costs make it more and more important for him to protect what he owns.

Insurance provides a large part of this protection and it's a sound business policy to keep insurance coverage up to value. But prices are moving upward too fast for insurance to keep pace day by day. Moreover such coverage often becomes an unbearable financial burden.

The Solution?

"Automatic" Sprinkler 10-point FIRE PROTECTION!

This not only minimizes property losses by fire—but also makes possible the purchase of more fire insurance at no extra cost. In addition, it enables you to insure property not reasonably insurable without it...protects intangible but vital business assets not insurable under *any* conditions.

As an executive concerned with today's high replacement costs with relation to your property or business, you should have our factual book, "The ABC of Fire Protection." It contains complete information on ***"Automatic" Sprinkler*** 10-Point Fire Protection. Ask for your copy today.

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

"Automatic" Sprinkler

FIRST IN FIRE PROTECTION

in the line are totally enclosed; intermediate ratings are totally enclosed and fan-cooled. In the larger ratings, units are also totally enclosed, fan-cooled, but are provided with external fins for greater heat dissipation. Motors are intended for heavy duty use on any general purpose application where dust, dirt or metal shavings are encountered frequently. Windings have heavy Formvar insulation, braced solidly with high grade baked varnish. Stator slots are lined with a cellulose acetate paper that resists effectively high voltage breakdown and high humidity conditions. Thick walled castings assure maximum bearing support and frame rigidity.

Medium Duty Pedestal Grinder

USE REPLY CARD—CIRCLE No. 10

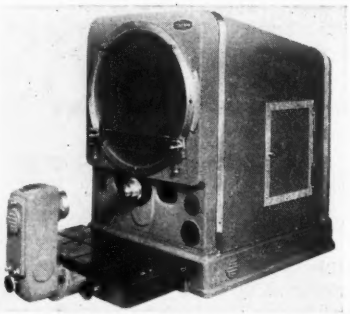
Reuland Electric Co., Alhambra, Calif., introduces a line of pedestal grinders, buffers and sanders incorporating the company's motor as a cost saving factor. Among features included are adjustable wheel guards that make grinding surfaces on worn wheels accessible at all times. Adjustable tool rests can be moved in any direction to ease work positioning. Hinged guard cover flips up to expose the entire wheel, simplifying wheel changes. Maximum 14 x 2-inch wheels are used. For worker protection, large and adjustable plate shields are included.

A manually-operated starter switch to provide overload protection is furnished as standard equipment. Magnetic starter is optional. Totally enclosed induction motor, with oversized ball bearings sealed and lubricated for life powers the grinder. Units are available for 110 and 220 v, single-phase, or 208, 220-440, 380 and 550-v three-phase operation on either 50 or 60 cycle.

Bench-Type Optical Comparator

USE REPLY CARD—CIRCLE No. 11

Production comparator, the bench-type model B-50, is announced by Portman Instrument Co., 6 Manhasset Ave., Port Washington, N. Y. Improved features include a 16-inch diameter image



. . . lens unit is exhaust power cooled

screen and plain horizontal work stage platform. Model's lens unit is exhaust power cooled and light source can be used with color filters to vary intensity and shading on the screen. Objective lens elements used provide maximum light, large objective areas and sharp definition at all powers. Magnifications of 10X, 20X, 31.25X, 50X, 62.50X and 100X are standard.

Working area is 6 x 16 inches. Image screen also has provision for mounting overlay chart holders to facilitate chart change over. Comparator's height is 30 inches;

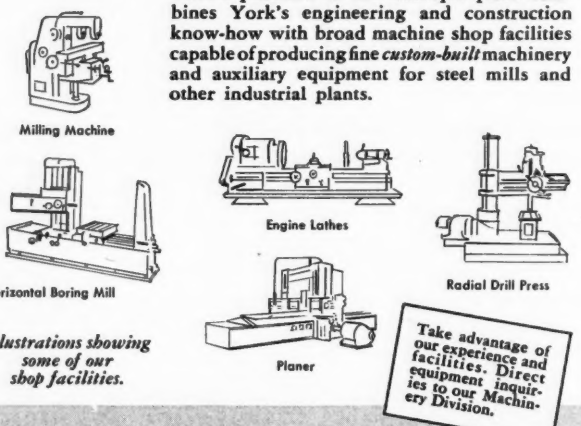
• Expert Help on All Engineering Problems
• Exacting Design and Drafting Service
• Construction Cost Estimates
• Complete Project Supervision
• Write for Our New Brochure A-25

YORK Engineering & Construction Company is Expanding

with purchase of the Gillespie Manufacturing Company, forming an affiliate:

YORK-GILLESPIE MANUFACTURING COMPANY

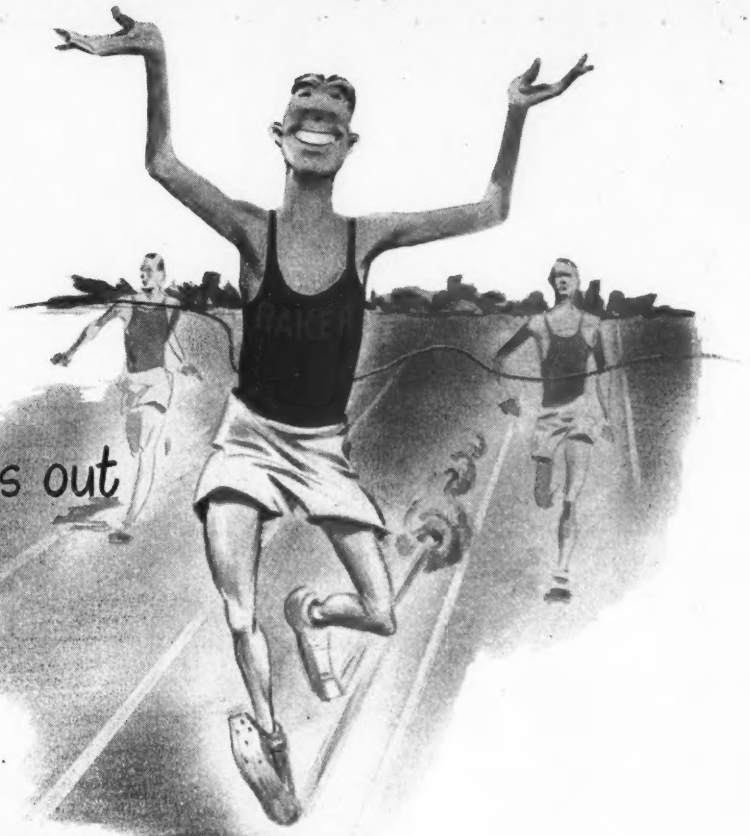
York's purchase of the Gillespie plant combines York's engineering and construction know-how with broad machine shop facilities capable of producing fine *custom-built* machinery and auxiliary equipment for steel mills and other industrial plants.



Illustrations showing some of our shop facilities.

Take advantage of our experience and facilities. Direct equipment inquiries to our Machinery Division.

YORK ENGINEERING & CONSTRUCTION CO.
and
YORK-GILLESPIE MANUFACTURING CO.
951 Penn Avenue, Pittsburgh 22, Pa.



ONE
always stands out

and among refractory dolomites it's...

BAKER'S MAGDOLITE

SUPERIOR quality is guaranteed by many years of "know how" of The J. E. Baker Company. Continued research means improved refractories whenever improvement is possible. MAGDOLITE'S superior chemical, physical, and mineralogical composition assures properly burned grain-size particles, helping you get more uniform ingots, in greater numbers, at lower fuel costs, with less defective production material. This means better performance for you. Yes, those who know insist on BAKER'S MAGDOLITE . . . the original Dead-Burned Dolomite!

ALWAYS 5 WAYS BETTER

- Composition
- Preparation
- Strength
- Economy
- Quality

JEBCO PRODUCTS SINCE 1889

THE J.E.BAKER COMPANY

YORK, PENNSYLVANIA

PLANTS: Hillsdale, Pennsylvania • Millersville, Ohio

Johnston Cinder Pots, with curved sidewalls, are built so that there is no distortion in the critical heat zone—the middle third of the pot. Left pot is 400 cu. ft. capacity, right pot, 75 cu. ft.

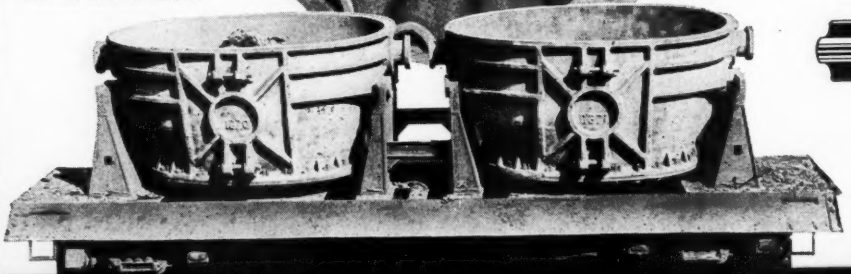
Johnston Cinder Pots

decrease slag disposal costs

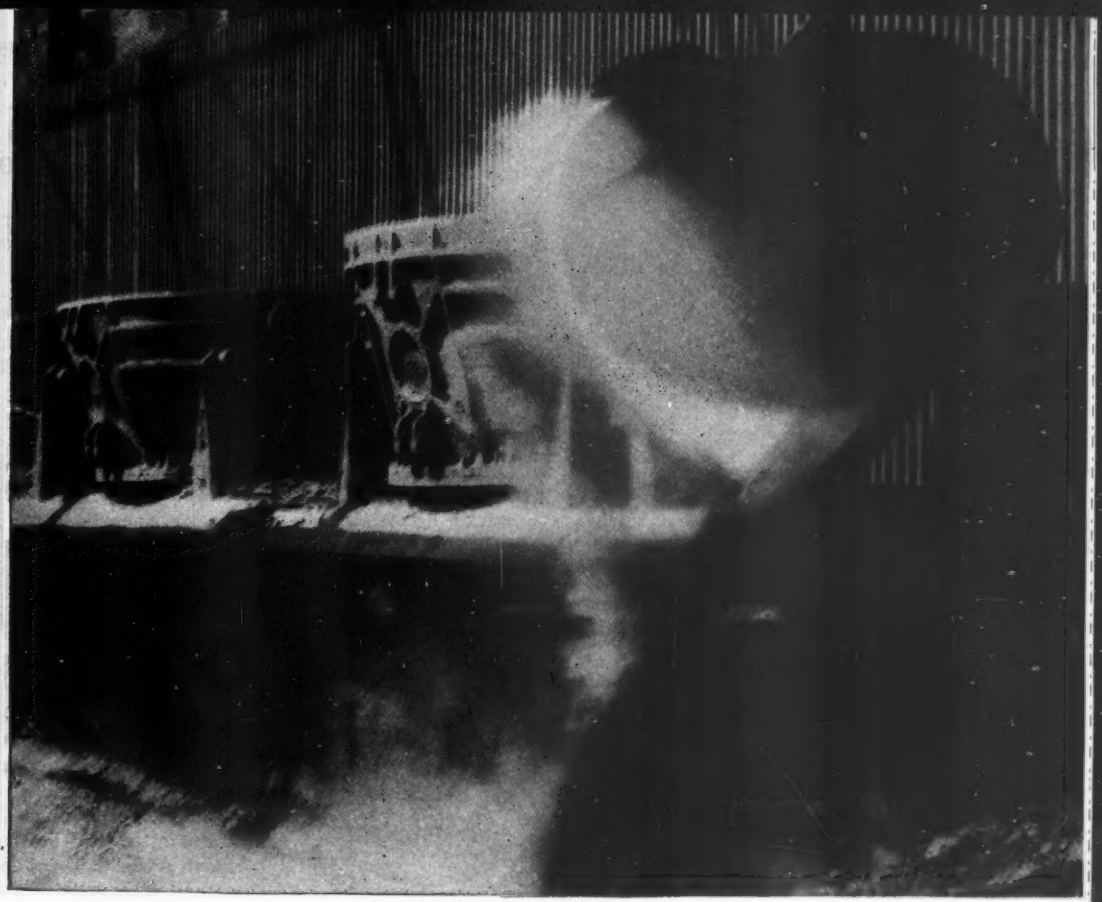
The long, useful life of Johnston Cinder Pots results from long application experience.

Corrugations provide maximum cooling surface area, help discharge skull without rapping.

Two 425 cu. ft. capacity oblong Johnston Cinder Pots mounted on dingey.



MACKINTOSH-HEMPHILL COMPANY
PITTSBURGH, U.S.A.



. . . because JOHNSTON CINDER POTS are engineered for increased heat-hours of service and faster turn-around time!

Performance records for Johnston Cinder Pots have been established in blast furnace and open hearth operations throughout the country, because Johnston Pots are designed for each job by experienced engineers. Here are two examples of how this engineering constantly improved Johnston Cinder Pot performance:

JOHNSTON CORRUGATED POTS with the expansible rim (400 cu. ft.) averaged 8,500 round trips in actual practice, against the expected 4,000 round trips at one plant.

MODERN, OBLONG, FLAT-BOTTOM POTS (designed to utilize existing tunnels) resulted in a 100% increase of capacity over older type pots.

FEATURES OF JOHNSTON CINDER POTS INCLUDE:

1. Expansible rims allow pots to retain shape under severe service conditions.
2. Corrugated walls permit rapid heat dissipation, and help eliminate firecracking and wall checking.
3. Patented construction prevents wall sag in slag-filled pots.
4. Johnston Pots are repairable if damaged in service.

For maximum service, for minimum costs of slag disposal, check with Mack-Hemp. Johnston Slag Handling Equipment Specialists have had much experience in the design and production of Cinder Pots, a valuable background of information you'll find most useful. To keep up with the latest developments in Johnston Cinder Pots, watch what's new at Mack-Hemp.

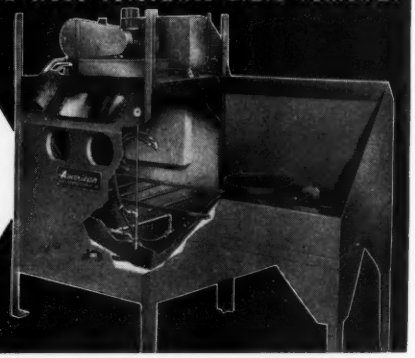
MACKINTOSH-HEMPHILL COMPANY

PITTSBURGH & MIDLAND, PA.

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: rolls . . . steel and special alloy castings . . . completely integrated strip mills . . . heavy duty engine lathes . . . Mackintosh-Hemphill rotary straighteners . . . improved Johnston patented corrugated cinder pots and slag-handling equipment . . . shape straighteners . . . end-thrust bearings . . . shears . . . levellers.

for simple and improved close tolerance scale removal

LIQUAMATTE
wet
blasting...



Fourteen advanced design features incorporated in the new Liquamatte make removal of light heat treat scale and surface cleaning easier and less costly. Its simplified design overcomes the many operating difficulties often found in wet blasting.

The Liquamatte has an exclusive vertical pump for slurry recirculation and agitation that overcomes packing leakage, shaft wear and plugging troubles. Ample clearance under the machine makes "good housekeeping" easy. Push button controlled — no valves to operate. The lightweight gun is easily maneuverable and throws a steady stream of slurry from any angle.

Applications in the heat treat field are many and varied making the Liquamatte a profitable cleaning room machine. Scale is completely removed from precision parts while holding tolerance as close as .0001". "Hand" finishes are produced mechanically in a matter of seconds.

Send today for bulletin No. 23 or ask for a demonstration.

American LIQUAMATTE WET BLASTING
WHEELABRATOR & EQUIPMENT CORP.
509 S. Byrkit St., Mishawaka 5, Ind.

NON-FLUID OIL
TRADE MARK REGISTERED

Stays In Shake-Out Bearings

Super-adhesive F-#925 Grade NON-FLUID OIL is designed to withstand the violent shocks and terrific vibration of shake-outs and screens. NON-FLUID OIL, through its exclusive adhesive properties, stays in ball and roller bearings and protects against friction long after ordinary greases have been "knocked out" or become "dead."

Send for a testing sample of F-#925 Grade NON-FLUID OIL and prove to yourself that it will stay in Shake-Outs and will remain "alive" longer, outlasting ordinary greases 3 to 5 times.

NEW YORK & NEW JERSEY LUBRICANT CO.
292 Madison Avenue, New York 17, N. Y. Works: Newark, N. J.

Represented in principal industrial centers.

Why not also write for new Bulletin #550 and free testing sample of "NR" grade NON-FLUID OIL especially manufactured for all pneumatic tools.

WAREHOUSES: Atlanta, Ga. • Birmingham, Ala. • Charlotte, N. C. • Chicago, Ill. Columbus, Ga. • Detroit, Mich. • Greensboro, N. C. • Greenville, S. C. • Providence, R. I. • St. Louis, Mo. Also represented in most other industrial centers including Cleveland, Ohio • Cincinnati, Ohio • Pittsburgh, Pa. • Syracuse, N. Y.

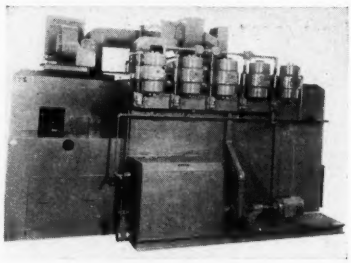
NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.

width, 20 inches; and depth, 45 inches.

Spirits Washer Run by One Man

USE REPLY CARD—CIRCLE No. 12

Mineral spirits washer made for one-man operation is offered by Detrex Corp., Detroit 32, Mich. Loading and unloading are done on one station by use of a return-type conveyor. Two washing stages and a forced air blow-off comprise



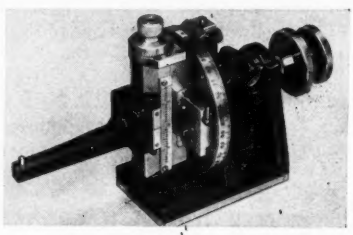
. . . loading done by return-type conveyor

the cleaning cycle. Easily adjusted spray nozzles provide an even, over-all coverage of parts being cleaned, regardless of irregularities in shape. Series of safety devices incorporated in the machine includes explosion-proof switches and motors, a complete exhaust system and automatically actuated carbon dioxide system.

Tool Dresses Wheel Forms

USE REPLY CARD—CIRCLE No. 13

For precision dressing all angle-tangent-to-radius grinding wheel forms, the Tangi-Matic dresser is offered by Perfex Gage & Tool Co., Dept. BC, 123 Avery St., Mt. Clem-



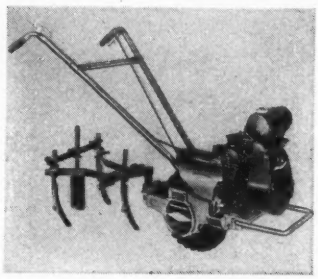
. . . micrometer provides direct reading

ens, Mich. Dresser is said to reduce setup time to one-fourth by eliminating Jo blocks, height gages and other precision instruments. Built-in micrometer provides direct reading and rapid, accurate adjustments. Setting for required angles is made by a vernier scale, graduated in minutes.

Two stop dogs control desired

why *stock steel in long lengths?*

when you can eliminate steps in your own manufacturing and Save Money!



This Power Cultivator Mfg. saved money

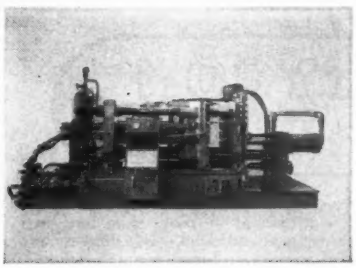
No manufacturer need stock standard lengths any longer. Nor need he figure processing these in his own plant to smaller dimensions.

We stock material in long lengths or coils and we process to exact sizes, which provides manufacturers with both processing and storage savings.

Our money saving services really eliminate manufacturing steps in your plant. These include sawing, flame cutting, drawing, shearing, rolling, cutting and slitting. And you get your steel at the *right price, properly packaged* and delivered *on time.*

Phone our nearest office today and one of our Sure Spec sales engineers will gladly give you the facts that can help you save considerable money.

This Fire Engine Mfg. saved money



This Die Casting Machine Mfg. saved money

PRODUCTS WAREHOUSED

Sheet and Strip HR, HRP, CR • Cold Finished Bars & Hot Rolled Bars, both carbon & alloy Plates • Galvanized, Long Ternes and Tin Mill Products • Seamless Tubing • Drill Rod

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arc. Machine dresses concave radii as small as 0.032-inch, full 180 degrees, using the small radius attachment furnished. It dresses from the bottom of the wheel, permitting operator to control the wheel accurately by using grinder draw feed.

Floor Patching Material

USE REPLY CARD—CIRCLE No. 14

An easily applied floor patching material developed by Permamix Corp., Chicago 1, Ill., can be used on any present type flooring. It is ready for use and can be stored indefinitely. Used in any temperature, it sets instantly and traffic can be resumed immediately.

Potassium Cyanide for Plating

USE REPLY CARD—CIRCLE No. 15

High purity potassium cyanide for use in bright plating and metal plating is available from Octagon Process Inc., Staten Island 1, N. Y. It is claimed that smooth operations are assured as no sulphide impurities are present.

Lubricant for Metalworking

USE REPLY CARD—CIRCLE No. 16

No. 140 Stik-Wax, developed by S. G. Johnson & Son Inc., Racine, Wis., provides a durable, clean lubrication for metal sanding, metal sawing, pipe cutting and threading, drilling, tapping, grinding and flush riveting. It can be applied manually or set in a position so that it is automatically applied as the machine operates.

Cutting Fluids for Tough Jobs

USE REPLY CARD—CIRCLE No. 17

Cutting fluids for use in difficult machining operations, such as work on stainless steel, high carbon steels and similar machining metals are announced by Magnus Chemical Co. Inc., Garwood, N. J. They have a high sulphur base content.

Solenoid Operated Pilot Valve

USE REPLY CARD—CIRCLE No. 18

A valve designed for use on small double acting cylinders up to 3 inches in diameter is available from Automatic Valve Co., Farmington, Mich. Designated as model 412-250, the four-way valve is made of noncorrosive metal and material throughout.

Sectional Belt Conveyors

USE REPLY CARD—CIRCLE No. 19

An improved line of sectional belt conveyors is offered by Transall Inc., Birmingham 4, Ala. Sections are chair supported for easy mounting on floors, ramps or cross ties. Anchored foundations are available for long distance overland installations.

Steel Truck Casters

USE REPLY CARD—CIRCLE No. 20

Bassick Co., Bridgeport 2, Conn., announces addition of an extra heavy 8-inch diameter size to its series 99 line of double ball race swivel steel truck casters.

Formula Bonds Metal

USE REPLY CARD—CIRCLE No. 21

Seal-All, developed by Allen Products Corp., Detroit, Mich., adheres to any material, toughens with age and never becomes brittle.

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with
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That's right!! You can paint right over rust with the new and different primer — TYGORUST — and, get excellent adhesion! Specifically developed for use under vinyl based coatings, TYGORUST virtually eliminates surface preparation — dries hard in minutes — covers up to 500-600 sq. ft./gallon — and, is rust inhibitive. What's more, its use is not limited to vinyls — it goes under any type of finish and provides excellent adhesion for all.

TYGORUST successfully primes iron and steel — clean or rusted — wet or dry. It can also be used on wood, concrete and previously painted surfaces (bituminous coatings excepted). It brushes easily — sprays beautifully. It can be over coated in as little as ten minutes.

Write for details, today — try TYGORUST, tomorrow! Give it the toughest tests — actually see how well it works!

PAINT OVER TYGORUST WITH TYGON PAINT

For maximum resistance to corrosive fumes and spillage, use the perfect running mate for TYGORUST — TYGON "Series TP" PAINT. TYGORUST was created for use with TYGON PAINT. TYGON PAINT was created — more than ten years ago — to provide outstanding protection against acids, alkalies, oils, greases, and water. TYGON PAINT is quickly applied — dries fast — forms a tough, smooth, flexible film that's long lasting, easy to clean, and non-flammable when dry.

Use the best defense against chemical corrosion. Use TYGORUST plus TYGON "Series TP" PAINT. Write, right now, for full details and resistance data — ask for Bulletin 720.

PLASTICS AND SYNTHETICS DIVISION

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348C

Substitutes Plate Burning by SHEARING ...and Saves Time

Photo SW-654

The electric foot switch, which is standard on all Steelweld Shears, is especially helpful when cutting wide plates, because the switch can be moved to wherever most convenient to reach. Ball bearing stanchions, illustrated, facilitate movement of large sheets into the shear.

A STEELWELD Pivoted-Blade Shear has cut production time considerably at the Youngstown, Ohio, plant of United Engineering and Foundry Co. Formerly, they cut plate by burning, but now the Steelweld shears it so fast that the operator can spend much of his time at other work.

When plates are cut by burning, a good deal of work is required to prepare the edges for assembly by welding. When plates are sheared, all such preparation is made unnecessary.

United Engineering's shear has a mild steel shearing capacity of 10' x ½" and is equipped with air-electric control. An air cylinder provides fast, positive operation for clutch and brake. The machine has a cutting speed of 45 strokes per minute.

Steelweld Shears have so many outstanding features to insure accuracy, speed production and make operation easier, that we urge you to get the facts on these modern tools. Ask for a nearby representative to call, without obligation, of course, or write for catalog below.

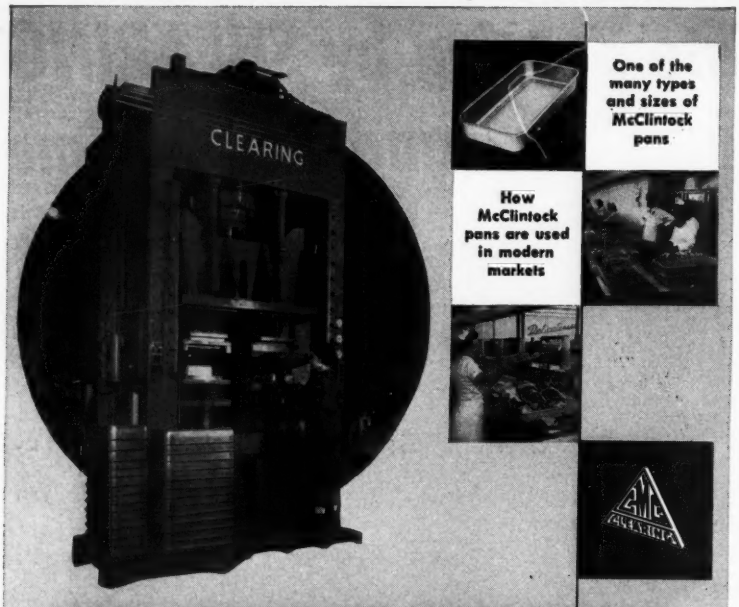
GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7834 East 282nd St., Wickliffe, Ohio

STEELWELD PIVOTED BLADE SHEARS



SMOOTH way to do a SMOOTH JOB

McClintock Manufacturing Co. of Los Angeles manufactures an extensive line of metal platters and pans used by up-to-date markets for the display of meat. For space in the cabinets, the pans must be rectangular; for sanitary reasons they must be one-piece and perfectly smooth. And they can't cost too much, either.

In the picture you see how McClintock uses a Clearing hydraulic press in drawing these pans. Automatic sequence control simplifies operation and delivers maximum production. Cushion pressure is accurately regulated, and the result is a smooth piece smoothly produced every time.

Whether your metal forming problem is like this one, or entirely different, Clearing engineers can help you. Clearing makes both mechanical and hydraulic presses to fit virtually any production requirement.

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HAMILTON DIVISION, HAMILTON, OHIO

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THE WAY TO EFFICIENT MASS PRODUCTION

It is not affected by gasoline, oil, naphtha, alcohol or water. Bonder seals leaks effectively in all types of containers, rigid and flexible lines, insulates and waterproofs electric wiring and ignition systems.

Conditioner for Spray Booths

USE REPLY CARD—CIRCLE No. 22

Designated PB-1, a conditioning agent for industrial paint spray booths, is offered by Pennsylvania Salt Mfg. Co., Philadelphia 7, Pa. It is used in water circulating systems and is designed to prevent adhesion of paint to curtain wall and to assist water cascade in preventing escape of paint into atmosphere.

Plastic Strip Finish

USE REPLY CARD—CIRCLE No. 23

Designated as VC-12, a plastic strip finish, developed by United Lacquer Mfg. Corp., Linden, N. J., provides protection against corrosion, abrasion and weather. When desired, it can be peeled off easily. The finish can be used on all metal surfaces and on wood. It is applied by spraying or by brush.

Scraper for Flat Surfaces

USE REPLY CARD—CIRCLE No. 24

Anderson Bros. Mfg. Co., Rockford, Ill., offers a hand scraper for flat surfaces. Model No. 5 uses replaceable blades 1¼-inches in width by ⅛-inch thick. Scraper is available in three lengths.

Revolving Joint for Clutches

USE REPLY CARD—CIRCLE No. 25

Barco Mfg. Co., Chicago 40, Ill., announces a light-running revolving joint for making air or hydraulic line connections to high speed rotating clutches, chucks and similar equipment. If features chemically inert V seal rings which have a low friction coefficient,

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72. Hydraulic Power Units

Rivett Lathe & Grinder, Inc.—Line of hydraulic power units in single, double and combination pump types is described in 4-page illustrated catalog 400. Information on pump performance, working drawings and specifications are given, as are maximum pressure at a given horsepower and horsepower requirements at given pressures.

73. Rustproofing Treatment

Octagon Process, Inc.—Rustshield 2, a chemical treatment that produces an oil-retaining rustproof surface for moving metal parts, is described in 4-page folder. Application methods and advantages of using treatment on sliding and bearing surfaces are discussed.

74. Tapping Heads

Procunier Safety Chuck Co.—Interested in increasing the capacity of your tapping equipment? Then get 6-page brochure No. 101 which illustrates, diagrams and charts line of high speed tapping heads. It analyzes working parts and construction features, their advantages and adaptability to special jobs. The Tap King heavy duty tapping attachment and the Tru-Grip tap holder are also described.

75. Conveyor Chains

Rockford Products Co.—Large or small quantities of conveyor chain, made to user's specifications and for all types of materials handling operations, can be supplied by this company, according to 4-page illustrated bulletin. Typical styles for industrial plant use are shown.

76. Adjustable-Speed Drives

Reliance Electric & Engineering Co. —A nontechnical explanation of the V*S drive, its economical features, application and operational flexibility in providing adjustable speeds from alternating current circuits is presented in 8-page illustrated bulletin D-2311. Seven basic functions of this power transmission method, available in five types of drives in ratings from ¾ to 200 hp are also covered. Tabulated data are included.

77. Wear-Resistant Parts

Haynes Stellite Co.—"Long-Wearing Machinery Parts" is title of 24-page illustrated booklet which deals with wide variety of cast and wrought alloy parts that are being used by industry to solve abrasion, corrosion and high-temperature problems. More than 60 blueprints, pictures and tables show some of the sizes and shapes in which alloys are used. Properties of various alloys are tabulated.

78. Machine Screws

Progressive Mfg. Co.—Chart showing how to dimension 11 standard types of machine screws is available for mounting in drafting, production and purchasing departments.

79. Controlling Pyrometers

Assembly Products, Inc. — Nine temperature ranges from −200 to 3000° F controllable with line of pyrometers and related equipment are covered in 4-page illustrated bulletin G-2. Various heat controlling applications possible with equipment are described, and service data and circuit diagrams are included.

80. Fan-Cooled Motors

Allis-Chalmers Mfg. Co.—Construction features and details of A-C totally-enclosed, fan-cooled motors with tube type air-to-air heat exchangers are found in 6-page bulletin 51B7149B. Ratings are from 40 hp at 600 rpm to 800 hp at 3600 rpm. Standard and explosionproof designs are available.

STEEL 3-17-52
Penton Building, Cleveland 13, Ohio

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81. Pocket Hardness Tester

A-H Co.—Testing of hardness of metals and determining various properties of other materials is function of pocket-size comparator tester described in 4-page illustrated folder. Details of operation and where it can be used are included in folder on this accurate instrument.

82. Geneva Drives

Geneva Machine & Tool Corp. — Complete dimensions and engineering data on four, five, six and eight point Geneva drives for any center distance up to 15 in. are given in 4-page illustrated bulletin "Indexing? Use a Geneva." Drives are available from stock in wide range of sizes. Engineering chart facilitates determining wheel outside diameter and driving radius for 3 to 30-point Geneva drives.

83. Spot & Seam Welding

Sciaky Bros., Inc. — "Resistance Welding at Work" contains 6 pages of factual information regarding use of spot and seam welding in aircraft construction. Advantages offered by resistance welding are explained in detail.

84. Horizontal Belt Conveyor

Rapids-Standard Co. — Assembly, sorting, order packing, checking, testing and inspection are a few of the jobs that can be performed advantageously on Rapistan Table-Veyor horizontal belt conveyor units described in 4-page illustrated bulletin TV-52. How the right length, width and height unit to fit individual needs can be obtained by combining low-cost standard sections is explained.

85. Industrial Furnaces

Westinghouse Electric Corp. — 38-page booklet B-5459 entitled "Harnessing Heat" describes each of 12 different gas and electric furnaces and briefly outlines their chief applications. Protective atmosphere section describes four basic types of atmospheres available—Endogas, Exogas, Monogas and Ammogas. Also included are data on material handling methods in furnaces, atmospheres for various metals and glossary of heat treating terms.

86. Solenoid Pilot Valves

Valvair Corp.—Whether it's air, water or oil, the new line of Valvair solenoid pilot valves afford proper control at speeds up to 400 cycles per minute. This unit is recommended as a pilot for cylinder or diaphragm operated valve and is offered in ⅛ and ¼-in. orifice sizes for operating pressures to 125 and 60 psi, respectively. Engineering and application data will be found in 8-page illustrated folder P.

EDITORIAL REPRINTS:

87. Reduced Tooling Costs

Have tooling costs skyrocketed because of rising demand for jigs and tools to help unskilled labor produce acceptable finished parts? If so, you'll be interested in one British equipment designer's methods for reducing costs. These include using steel shapes for clamps, bodies and attachments, welding of components and using fasteners, cold rolled steel bars and drill rod. Request STEEL reprint, "Tooling Can Be Cheaper."

88. Build-up in Steel

STEEL's recent special report entitled "Build-Up in Steel" can now be obtained in reprint form. This report reveals the steel ingot and pig iron capacities by plants as of Jan. 1, 1952, along with Jan. 1, 1951 figures for comparative purposes. It also shows what expansions are under way now or are projected.

89. Cut Out The Noise

When steel meets steel, there's bound to be noise. If you're interested in reducing ear-splitting sounds for more efficiency in your plant, send for reprint of C. E. Crede's article in Feb. 25 STEEL entitled "Toned-Down Noise Tunes Up Operations." Discussed are many causes and remedies for unnecessary clang and clatter in metalworking operations.

90. Casting Rare Metals

Casting and melting procedures for the common metals do not apply to those that are more rare. Attention must be paid to revised concepts and techniques to assure a satisfactory product. Frank Gibadlo in his STEEL article "Rare Metals Require Precision Furnacing" describes some of these casting techniques which employ high vacuum and inert gas atmospheres. Send for your reprint.

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6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
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little affected by increases in pressure and free from scoring tendencies. Joint may be used at temperatures as high as 425° F.

Electric Insulating Varnish

USE REPLY CARD—CIRCLE No. 26

An all-purpose electric insulating varnish, developed by General Electric's Chemical Division, Pittsfield, Mass., is for use on a wide variety of electric equipment. It is suitable for treating motor and generator cores and windings, magnet coils and transformer windings. Known as GE 9700, it may be applied by dipping, roller coating, brushing or spraying.

Variable Speed Units

USE REPLY CARD—CIRCLE No. 27

Type KFEA variable speed units with single reduction gears in ratings of 20 and 25 hp are available from Sterling Electric Motors Inc., Los Angeles 22, Calif. Units are made in speeds of 728 rpm and lower with infinite speed adjustment of 2:1, 3:1 or 4:1.

Rollers Kept in Alignment

USE REPLY CARD—CIRCLE No. 28

Design principle of Guiderol cageless bearings, developed by McGill Mfg. Co., Valparaiso, Ind., utilizes grooved rollers and a guide rail to keep rollers in alignment. Any shift off center causes contact between roller and rail and returns roller to true axis.

Explosion-Proof Control Valve

USE REPLY CARD—CIRCLE No. 29

Electroaire explosion-proof valve, announced by Bellows Co., Akron 9, O., is an electrically controlled four-way directional air valve. It uses the air it directs to shift the slide valve. Tiny, sealed, 8-v solenoids serve as triggers to release the pressure of the incoming high pressure air against either side of a floating piston which operates the slide valve.

Ford knew something was in the air!

WHEN FORD pried the lid off this box, a revolutionary new way to pack auto parts came to light. Custom was to spray bare metal surfaces with a preservative coating. Then, before parts were usable, they had to have a "hot bath." However, after months of open storage with only Angier VPI* Wrap to line this box, the uncoated parts came out shiny and clean. "No evidence of rust" said Ford's Export Division. Because VPI takes the rust-making power out of air and moisture, you *know* when this invisible vapor is in the air.

NOW EIGHT BIG NAMES IN THE AUTOMOBILE WORLD are saving priceless man-hours with Angier VPI Wrap. No messy coatings to apply means no "cleaning" when parts are unpacked. Now work areas are *clean . . . SAFER!* And because VPI requires no special equipment, valuable floor space is being released for production needs. Learn how this *proven* vapor method of rust prevention can benefit you. Write: Angier Corporation, Framingham 8, Mass.

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He brings to your shop a personalized program *expressly developed* to give you more production returns from every hour, dollar and pound of steel you invest in tools and dies!

He brings you practical, *proven* methods that add speed and sureness to the hands of toolmakers and heat treaters. He makes available new ideas to add hours of service life to tools and dies, reduce machine downtime and squeeze *more* from existing plant facilities. He is your Carpenter representative, bringing you Carpenter's personalized service program . . . at no extra cost.

Look what backs his call to your shop: Time-saving data from constant Carpenter laboratory research, issued in regular Service Bulletins. More than 60 years of experience in applying tool steels, made available in Carpenter's Matched Tool and Die Steel Manual. Timely tips on getting more from present heat treating equipment, yours in a new slide chart. Modern, *visual* slide films to refresh skilled men and train apprentices.

Ask *your* friends in the business what Carpenter's personalized program has meant to them. Then, knowing how it can help *you* meet today's critical demands for more output, start now to put it in motion.

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DON'T WAIT... COOPERATE!
The U.S. Needs Your Steel Scrap, Now

The Market Outlook

THE STEEL supply may be upset again—this time by a steelworkers' strike.

This would plunge the country right back into the steel shortage it is just working out of. The last time when steel demand and supply were getting into balance the Korean war set off a shortage. That was 20 months ago.

A few weeks ago the odds were there'd be no strike in the steel industry. Since then the situation has deteriorated to the extent there's a 3-2 chance of a strike. The steel industry maintains it will need a price increase to be able to grant a wage increase. The industry probably could get a $3 a ton price increase under the Capehart amendment to the Defense Production Act, but that amount would be predicated on additional costs already incurred in its operations. The $3 would in no way cover the wage boost the government is reported to favor.

POSSIBILITIES—If the government sanctions a steel wage increase of the proportions suggested and refuses to allow a compensating price increase, steelmakers are prepared to sit out a strike. Their tougher attitude reflects the easing in steel demand of the last two months and the realization that adequate profit margins must be maintained in the months ahead when operations may drift to lower levels. Better to suffer a strike now than to accept an inequitable settlement, they reason.

Such a break in supply would make steel scarce again. Government controllers might even look approvingly on a renewal of scarcity. They've just got controls working fully, and they don't like to ditch them until the international situation improves. Renewed scarcity would help keep controls.

PREPARING—Darkening of prospects for an amicable settlement of the wage-price problem in the steel industry started locals of the steelworkers' union setting up strike committees.

The easing under way for some weeks in the demand for steel was marked last week by a production cut by Sharon Steel Corp. It took two open hearths out of operation at its Farrell, Pa., works.

In contrast, the national rate of steel production held last week at a record level of 2,110,000 tons. STEEL estimates the national ingot production rate as unchanged at 101.5 per cent of capacity.

THE PICTURE—Even though there has been an easing in the pressure for steel, the demand for some products is still greater than the supply. That is particularly true as to most sizes of hot-rolled and cold-rolled carbon bars, forging bars and billets, wide flange structural shapes, heavy plates and galvanized sheets.

Even on some of those products there's a tendency to ease. One consumer got a "bonus" of hot-rolled bars from a midwestern producer whose business is affected adversely by a drop in demand from agricultural equipment manufacturers. A Pittsburgh district producer is soliciting tonnage more actively.

EARLY BIRDS—Cold-rolled sheets continue among the easiest products in supply. This prompted early opening of third-quarter order books by producers in an effort to schedule as much desirable business as possible.

There's some question whether government increases in allotments of steel for construction will help prevent a sag in demand for structurals. Fabricators think much potential work may not develop.

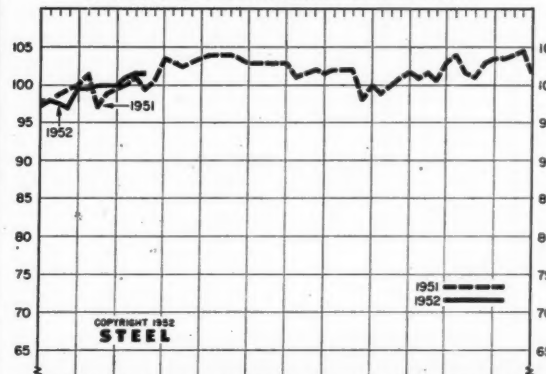
CONTRAST— Consumers of light gage plates, especially those from hot-strip mills, find it easy to get sufficient tonnage. Heavy gage material remains as tight as ever.

Demand for wire continues soft, and in many instances inventories of rod are the highest in months.

Pig iron supplies are fairly satisfactory in most areas, yet there's no surplus of iron.

Iron and steel markets are marking time pricewise. STEEL's weighted index on finished steel is 171.92 while the arithmetical price composite is $106.32. Pig iron price composites hold at $52.54 on No. 2 foundry, $52.16 on basic, $53.27 on malleable. Steelmaking scrap composite is $43.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Mar. 15	Change	Same Week 1951	Same Week 1950
Pittsburgh	104	+ 0.5*	88	61.5
Chicago	103	0*	106.5	84.5
Mid-Atlantic	98	0	100.5	72
Youngstown	102	— 3	106	50
Wheeling	99.5	— 0.5	96.5	90
Cleveland	98	— 0.5*	100.5	99
Buffalo	104	0	104	98.5
Birmingham	104	0	100	42
New England	80	—10	90	80
Cincinnati	91.5	— 0.5	104	85
St. Louis	79	0	97	84.5
Detroit	106	+ 4*	107	104
Western	103	0	100	81
Estimated national rate	101.5	0	99.5	74.5

Based on weekly steelmaking capacity of 2,077,040 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 47 Production-Engineering News—p. 83

Composite Market Averages

FINISHED STEEL INDEX, Weighted:

	Mar. 13 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100) ..	171.92†	171.92†	171.92†	171.92	118.67
Index in cents per lb.	4.657†	4.657†	4.657†	4.657	3.215

ARITHMETICAL PRICE COMPOSITES:

Finshed Steel, NT	$106.32†	$106.32†	$106.32†	$106.32	$69.82
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	52.54	32.99
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	32.49
Malleable Pig Iron, GT ...	53.27	53.27	53.27	53.27	33.71
Steelmaking Scrap, GT	43.00	43.00	43.00	44.00	37.92

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Preliminary.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Mar. 13 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh.....	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R., del. Philadelpha	4.223	4.223	4.223	4.18	2.96
Bars, C.F., Pittsburgh.....	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh...	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, del. Philadelphia...	3.918	3.918	3.918	3.90	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.65
Plates, Chicago	3.70	3.70	3.70	3.70	2.65
Plates, Coatesville, Pa.	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.65
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh...	3.60–75	3.60–75	3.60–75	3.60–75	2.50
Sheets, H.R., Chicago.....	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh...	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh...	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh.....	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.35
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	4.125
Tin plate box, Pittsburgh..	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$66.00	$50.00
Wire rods, 5/32-⅝", Pitts....	4.10–30	4.10–30	4.10–30	4.10–30	2.675

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$34.00
Basic, Valley	52.00	52.00	52.00	52.00	33.00
Basic, del. Phila.	56.61	56.61	56.61	56.39	35.52
No. 2 Fdry, Pitts.	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	52.50	33.00
No. 2 Fdry, Valley	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, Del. Phila. ...	57.11	57.11	57.11	56.89	36.02
No. 2 Fdry, Birm.	48.88	48.88	48.88	48.88	29.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	55.58	34.75
Malleable Valley	52.50	52.50	52.50	52.50	33.50
Malleable, Chicago	52.50	52.50	52.50	52.50	33.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	40.50
Ferromanganese, Etna, Pa..	188.00	188.00	188.00	188.00	140.25*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts...	$44.00	$44.00	$44.00	$45.00	$38.00
No. 1 Heavy Melt, E. Pa...	42.50	42.50	42.50	43.50	39.25
No 1 Heavy Melt, Chicago.	42.50	42.50	42.50	43.50	32.50
No. 1 Heavy Melt, Valley..	44.00	44.00	44.00	45.00	38.00
No. 1 Heavy Melt, Cleve...	43.00	43.00	43.00	44.00	37.50
No. 1 Heavy Melt, Buffalo.	43.00	43.00	43.00	44.00	35.00
Rails, Rerolling, Chicago...	52.50	52.50	52.50	52.50	41.50
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	49.00*	43.50

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connisvl....	$14.75	$14.75	$14.75	$14.75	$8.75–$9
Beehive, Fdry., Connisvl....	17.50	17.50	17.50	17.50	9.75–11.00
Oven Fdry., Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	21.50
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	18.80	18.80	18.80	16.80	14.80-14.85
Tin, New York	121.50	121.50	121.50	134.00	70.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex. ...	50.00	50.00	50.00	42.00	28.25
Nickel, refinery, duty paid.	56.50	56.50	56.50	50.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
AlabamaCity, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88	55.38	55.88	....
Syracuse, N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
IndianaHarbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill., Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	57.50	58.00	....
Fontana, Calif. K1	58.00	58.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
LosAngeles, SanFrancisco, del. ...	60.16	60.66	....	....
GraniteCity, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Geneva, Utah C11	52.00	52.50	....	....
LoneStar, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
NevilleIsland, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKeesRocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

NiagaraFalls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.37
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Mar. 13, 1952; cents per pound except as otherwise noted. Changes shown in Italics. Code numbers following mill points indicate producing company; key on next two pages

INGOTS, Carbon, Forging (NT)
Fontana, Calif. K1 ....$79.00
Munhall, Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana, Calif. K1 ....80.00
Houston, Tex. S5 .....62.00
Midland, Pa. C18 .....54.00
Munhall, Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer, Pa. U5 ....$56.00
Clairton, Pa. U5 .....56.00
Ensley, Ala. T2 .....56.00
Fairfield, Ala. T2 ....56.00
Fontana, Calif. K1 ....75.00
Gary, Ind. U5 .....56.00
Johnstown, Pa. B2 ....56.00
Lackawanna, N.Y. B2 ..56.00
Munhall, Pa. U5 .....56.00
So. Chicago, Ill. U5 ....56.00
So. Duquesne, Pa. U5 ..56.00

Carbon, Forging (NT)
Bessemer, Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton, O. R2 .....66.00
Clairton, Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken, Pa. A3..73.00
Detroit R7 .....69.00
Ensley, Ala. T2 .....66.00
Fairfield, Ala. T2 .....66.00
Fontana, Calif. K1 ....85.00
Gary, Ind. U5 .....66.00
Geneva, Utah C11 .....66.00
Houston, Tex. S5 .....74.00
Johnstown, Pa. B2 .....66.00
Lackawanna, N.Y. B2..66.00
Los Angeles B3 .....85.00
Munhall, Pa. U5 .....66.00
Seattle B3 .....85.00
So. Chicago R2, U5, W14..66.00
So. Duquesne, Pa. U5 ...66.00
So. San Francisco B3 ..85.00

Alloy, Forging (NT)
Bethlehem, Pa. B2 ....$70.00
Buffalo R2 .....70.00
Canton, O. R2 .....70.00
Canton, O. (29) T7 ....66.00
Conshohocken, Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana, Calif. K1 ....89.00
Gary, Ind. U5 .....70.00
Houston, Tex. S5 .....78.00
Ind. Harbor, Ind. Y1 ..70.00
Johnstown, Pa. B2 .....70.00
Lackawanna, N.Y. B2 ..70.00
Los Angeles B3 .....90.00
Massillon, O. R2 .....70.00
Midland, Pa. C18 .....70.00
Munhall, Pa. U5 .....70.00
So. Chicago R2, U5, W14..70.00
So. Duquesne, Pa. U5 ..70.00
Struthers, O. Y1 .....70.00
Warren, O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton, O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana, Calif. K1 ...103.00
Gary, Ind. U5 .....82.00
Massillon, O. R2 .....82.00
So. Chicago, Ill. R2 ....82.00
So. Duquesne, Pa. U5 ..82.00

SHEET BARS (NT)
Fontana, Calif. K1 ....$89.00

SKELP
Aliquippa, Pa. J5 ....$3.45
Munhall, Pa. U5 .....3.35
Warren, O. R2 .....3.35
Youngstown R2, U5 ....3.35

WIRE RODS
Alton, Ill. L1 .....4.40
Alabama City, Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora, Pa. A7 .....4.10
Fairfield, Ala. T2 .....4.10
Fontana, Calif. K1 ....4.90
Houston, Tex. S5 .....4.50
Johnstown, Pa. B2 .....4.10
Joliet, Ill. A7 .....4.10
Los Angeles B3 .....4.90
Minnequa, Colo. C10 ...4.35
Monessen, Pa. P7 .....4.30
No. Tonawanda, N.Y. B11..4.10
Pittsburg, Calif. C11 ...4.75
Portsmouth, O. P12 ....4.30
Roebling, N.J. R5 .....4.20
So. Chicago, Ill. R2 .....4.10
Sparrows Point, Md. B2..4.20
Sterling, Ill. (1) N15 ..4.10
Struthers, O. Y1 .....4.10
Torrance, Calif. C11 ....4.90
Worcester, Mass. A7 ....4.40

SHEET STEEL PILING
Ind. Harbor, Ind. I-2 ....4.45
Lackawanna, N.Y. B2 ...4.45
Munhall, Pa. U5 .....4.45
So. Chicago, Ill. U5 ....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
Alabama City, Ala. R2 ..3.60
Aliquippa, Pa. J5 .....3.65
Bessemer, Ala. T2 .....3.65
Bethlehem, Pa. B2 .....3.70
Clairton, Pa. U5 .....3.65
Fairfield, Ala. T2 .....3.65
Fontana, Calif. K1 .....4.25
Gary, Ind. U5 .....3.65
Geneva, Utah C11 .....3.65
Houston, Tex. S5 .....4.05
Ind. Harbor, Ind. I-2 ....3.65
Johnstown, Pa. B2 .....3.70
Kansas City, Mo. S5 ....4.25
Lackawanna, N.Y. B2 ..3.70
Los Angeles B3 .....4.25
Minnequa, Colo. C10 ....4.10
Munhall, Pa. U5 .....3.65
Niles, Calif. (22) P1 ....4.85
Phoenixville, Pa. P4 ....5.90
Portland, Oreg. O4 .....4.50
Seattle B3 .....4.30
So. Chicago, Ill. U5, W14..3.65
So. San Francisco B3 ...4.20
Torrance, Calif. C11 ....4.25
Weirton, W.Va. W6 ...3.90

Alloy Stand. Shapes
Clairton, Pa. U5 .....4.35
Fontana, Calif. K1 .....5.55
Munhall, Pa. U5 .....4.35
So. Chicago, Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa, Pa. J5 .....5.50
Bessemer, Ala. T2 .....5.50
Bethlehem, Pa. (14) B2..5.50
Clairton, Pa. U5 .....5.50
Fairfield, Ala. T2 .....5.50
Fontana, Calif. K1 .....6.10
Gary, Ind. U5 .....5.50
Geneva, Utah C11 .....5.50
Ind. Harbor, Ind. I-2 ....5.50
Ind. Harbor, Ind. Y-1 ....6.00
Johnstown, Pa. B2 .....5.50
Lackawanna, N.Y. (14) B2 5.50
Los Angeles B3 .....6.05
Munhall, Pa. U5 .....5.50
Seattle B3 .....6.10
So. Chicago, Ill. U5 .....5.50
So. San Francisco B3 ...6.00
Struthers, O. Y1 .....6.00

Wide Flange
Bethlehem, Pa. B2 .....3.70
Clairton, Pa. U5 .....3.65
Fontana, Calif. K1 .....4.65
Lackawanna, N.Y. B2 ..3.70
Munhall, Pa. U5 .....3.65
So. Chicago, Ill. U5 ....3.65

H.S., L.A. Wide Flange
Bethlehem, Pa. B2 .....5.50
Lackawanna, N.Y. B2 ..5.50
Munhall, Pa. U5 .....5.45
So. Chicago, Ill. U5 ....5.45

BEARING PILES
Munhall, Pa. U5 .....3.65
So. Chicago, Ill. U5 ....3.65

PLATES, High-Strength Low-Alloy
Aliquippa, Pa. J5 .....5.65
Bessemer, Ala. T2 .....5.65
Clairton, Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken, Pa. A3 ..5.90
Fairfield, Ala. T2 .....5.65
Fontana, Calif. (30) K1 ..6.25
Gary, Ind. U5 .....5.65
Geneva, Utah C11 .....5.65
Ind. Harbor, Ind. I-2 ....5.65
Ind. Harbor, Ind. Y-1 ....6.15
Johnstown, Pa. B2 .....5.65
Munhall, Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon, Pa. S3 .....5.70
So. Chicago, Ill. U5 .....5.65
Sparrows Point, Md. B2 ..5.65
Warren, O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont, Del. C22 .....4.85
Coatesville, Pa. L7 ....5.25
Conshohocken, Pa. A3 ..5.05
Fontana, Calif. K1 .....5.70
Gary, Ind. U5 .....4.75
Johnstown, Pa. B2 .....4.75
Munhall, Pa. U5 .....4.75
Sharon, Pa. S3 .....5.20
So. Chicago, Ill. U5 .....4.75
Sparrows Point, Md. B2..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken, Pa. A3 ..4.76
Ind. Harbor, Ind. I-2 ....4.75
Munhall, Pa. U5 .....4.75
So. Chicago, Ill. U5 .....4.75

PLATES, Ingot Iron
Ashland, c.l. (15) A10. ..3.95
Ashland, lcl (15 A10 ...4.45
Cleveland, c.l. R2 .....4.30
Warren, O. c.l. R2 .....4.30

PLATES, Carbon Steel
Alabama City, Ala. R2 ..3.70
Aliquippa, Pa. J5 .....3.70
Ashland, Ky. (15) A10 ..3.70
Bessemer, Ala. T2 .....3.70
Clairton, Pa. U5 .....3.70
Claymont, Del. C22 ....4.15
Cleveland J5, R2 .....3.70
Coatesville, Pa. L7 ....4.15
Conshohocken, Pa. A3 ..4.15
Fairfield, Ala. T2 .....3.70
Fontana, Calif. (30) K1..4.30
Gary, Ind. U5 .....3.70
Granite City, Ill. G4 ....4.40
Geneva, Utah C11 .....3.70
Harrisburg, Pa. C5 ....6.30
Houston, Tex. S5 .....4.10
Ind. Harbor, Ind. I-2, Y1 3.70
Johnstown, Pa. B2 .....3.70
Lackawanna, N.Y. B2 ..3.70
Minnequa, Colo. C10 ....4.50
Munhall, Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon, Pa. S3 .....3.95
So. Chicago, Ill. U5 W14..3.70
Sparrows Point, Md. B2..3.70
Steubenville, O. W10 ....3.70
Warren, O. R2 .....3.70
Weirton, W.Va. W6 ....4.00
Youngstown R2, U5, Y1..3.70

PLATES, Carbon A.R.
Fontana, Calif. K1 .....5.45
Geneva, Utah C11 .....4.85

PLATES, Wrought Iron
Economy, Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
Alabama City, Ala. R2 ..3.70
Aliquippa, Pa. J5 .....3.70
Alton, Ill. L1 .....4.15
Atlanta, Ga. A11 .....4.25
Bessemer, Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton, O. R2 .....3.70
Clairton, Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville, Calif. J7 ....4.45
Fairfield, Ala. T2 .....3.70
Fontana, Calif. K1 .....4.40
Gary, Ind. U5 .....3.70
Houston, Tex. S5 .....4.10
Ind. Harbor, Ind. I-2 Y1..3.70
Johnstown, Pa. B2 .....3.70
Kansas City, Mo. S5 .....4.30
Lackawanna, N.Y. B2 ..3.70
Los Angeles B3 .....4.40
Milton, Pa. B6 .....4.55
Minnequa, Colo. C10 ....4.15
Niles, Calif. P1 .....5.05
N. Tonawanda, N.Y. B11..3.70
Pittsburg, Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland, Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
Struthers, O. Y1 .....3.70
Torrance, Calif. C11 ....4.40
Weirton, W.Va. W6 ....3.85
So. Chicago R2, U5, W14..3.70
So. Duquesne, Pa. U5 ....3.70
So. San Fran., Cal. B3 ...4.45
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. Shapes
Aliquippa, Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown, Pa. B2 .....3.70
Lackawanna, N.Y. B2 ..3.70
Niles, Calif. P1 .....5.05
Portland, Oreg. O4 .....4.65
San Francisco S7 .....4.85

BAR SIZE ANGLES; H.R. CARBON
Bethlehem, Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem, Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton, O. R2 .....4.30
Canton, O. (29) T7 .....3.95
Clairton, Pa. U5 .....4.30
Detroit, R7 .....4.45
Ecorse, Mich. G5 .....4.65
Fontana, Calif. K1 .....5.35
Gary, Ind. U5 .....4.30
Houston, Tex. S5 .....4.70
Ind. Harbor, Ind. I-2 Y1..4.30
Johnstown, Pa. B2 .....4.30
Kansas City, Mo. S5 .....4.90
Lackawanna, N.Y. B2 ..4.30
Los Angeles B3 .....5.35
Massillon, O. R2 .....4.30
Midland, Pa. C18 .....4.30
So. Chicago R2, U5, W14..4.30
So. Duquesne, Pa. U5 ....4.30
Struthers, O. Y1 .....4.30
Warren, O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES Hot-Rolled Alloy
Clairton, Pa. U5 .....4.55
Gary, Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa, Pa. J5 .....5.55
Bessemer, Ala. T2 .....5.55
Bethlehem, Pa. B2 .....5.55
Clairton, Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield, Ala. T2 .....5.55
Fontana, Calif. K1 .....6.60
Gary, Ind. U5 .....5.55
Ind. Harbor, Ind. I-2 ....5.55
Indiana Harbor, Ind. Y1..6.05
Johnstown, Pa. B2 .....5.55
Lackawanna, N.Y. B2 ....5.55
Los Angeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So. Duquesne, Pa. U5 ....5.55
So. San Francisco B3 ....6.30
Struthers, O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge, Pa. W18 ....4.55
Beaver Falls, Pa. M12, R2 4.55
Buffalo, B5 .....4.60
Camden, N.J. P13 .....5.00
Carnegie, Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora, Pa. A7 .....4.55
Elyria, O. W8 .....4.55
Franklin Park, Ill. N5 ....4.55
Gary, Ind. R2 .....4.55
Green Bay, Wis. F7 .....4.55
Hammond, Ind. L2, M13..4.55
Hartford, Conn. R2 .....5.10
Harvey, Ill. B5 .....4.55
Los Angeles R2 .....6.00
Mansfield, Mass. B5 ....5.10
Massillon, O. R2, R8 ....4.55
Monaca, Pa. S17 .....4.55
Newark, N.J. W18 .....5.00
Plymouth, Mich. P5 .....4.80
Pittsburgh J5 .....4.55
Putnam, Conn. W18 .....5.10
Readville, Mass. C14 ....5.10
St. Louis, Mo. M5 .....4.95
So. Chicago, Ill. W14 ....4.55
Spring City, Pa. (5) R3..5.00
Struthers, O. Y1 .....4.55
Waukegan, Ill. A7 .....4.55
Youngstown F3, Y1 .....4.55

BARS, Cold-Finished Alloy
Ambridge, Pa. W18 ....5.40
Beaver Falls, Pa. M12 ....5.40
Bethlehem, Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden, N. J. P13 .....5.80
Canton, O. R2 .....5.40
Canton, O. (29) T7 .....4.90
Carnegie, Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora, Pa. A7 .....5.45
Elyria, O. W8 .....5.40
Gary, Ind. R2 .....5.40
Hammond, Ind. L2, M13..5.40
Hartford, Conn. R2 .....5.85
Harvey, Ill. B5 .....5.40
Lackawanna, N.Y. B2 ....5.40
Mansfield, Mass. B5 ....5.85
Massillon, O. R2, R8 ....5.40
Midland, Pa. C18 .....5.40
Monaca, Pa. S17 .....5.40
Newark, N.J. W18 .....5.75
Plymouth, Mich. P5 .....5.60
So. Chicago, Ill. R2, W14..5.40
Struthers, O. Y1 .....5.40
Warren, O. C17 .....5.40
Waukegan, Ill. A7 .....5.45
Worcester, Mass. A7 ....5.75
Youngstown F3, Y1 .....5.40

RAIL STEEL BARS
Chicago Hts. (3,4) C2 ....4.75
Chicago Hts. (3,4) I-2 ....4.75
Franklin, Pa. (3,4) F5 ..4.75
Fort Worth, Tex. (26) T4..4.85
Huntngtn, W.Va. (3) W7..5.50
Marion, O. (3) P11 .....4.75
Moline, Ill. (3) R2 .....3.80
Tonawanda (3,4) B12 ..4.75
Williamsport (3) S19 ....5.00
Williamsport (4) S19 ....5.10

BARS, Wrought Iron
Dover, N.J. (Staybolt) U1 15.00
Dover, (Eng. Bolt) U1 ..13.50
Dover, (Wrgh. Iron) U1 12.25
Economy, Pa. (S.R.) B14..9.60
Economy, Pa. (D.R.) B14 11.90
Economy, (Staybolt) B14 12.20
McK. Rks. (Staybolt) L5 14.50
McK. Rks. (S.R) L5 ....9.60
McK. Rks. (D.R.) L5 ..13.00

BARS, Reinforcing (Fabricators)
Alabama City, Ala. R2 ..3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville, Calif. J7 ....4.45
Fairfield, Ala. T2 .....3.70
Fontana, Calif. K1 .....4.40
Gary, Ind. U5 .....3.70
Houston, Tex. S5 .....4.10
Ind. Harbor, Ind. I-2 Y1..3.70
Johnstown, Pa. B2 .....3.70
Kansas City, Mo. S5 .....4.30
Lackawanna, N.Y. B2 ..3.70
Los Angeles B3 .....4.40
Milton, Pa. B6 .....4.55
Minnequa, Colo. C10 ....4.50
Munhall, Pa. U5 .....3.70
Niles, Calif. P1 .....4.65
Pittsburgh J5 .....3.70
Portland, Oreg. O4 .....4.65
San Francisco S7 .....4.85
Seattle B3, N14 .....4.60
Sharon, Pa. S3 .....3.95
So. Chicago R2, U5, W14..3.70
Sparrows Point, Md. B2 ..3.70
Struthers, O. Y1 .....3.70
Torrance, Calif. C11 ....4.40
Warren, O. R2 .....3.70
Weirton, W.Va. W6 ....4.00
Youngstown R2, U5 ....3.70

BARS, Reinforcing (Fabricated; to Consumers)
Huntington, W.Va. W7 ..5.50
Johnstown, ¼-1" B2 ...4.75
Los Angeles B3 .....5.45
Marion, O. P11 .....5.00
Seattle B3, N14 .....5.55
So. San Francisco B3 ....5.45
Sparrows Pt, ¼-1" B2 ...4.75
Williamport, Pa. S19 ....5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
Alabama City, Ala. R2 ..3.60
Ashland, Ky. (8) A10 ...3.60
Butler, Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken, Pa. A3 ..4.00
Detroit, M1 .....4.40
Ecorse, Mich. (8) G5 ....3.80
Fairfield, Ala. T2 .....3.60
Fontana, Calif. K1 .....4.55
Gary, Ind. U5 .....3.60
Geneva, Utah C11 .....3.70
Granite City, Ill. G4 .....4.30
Ind. Harbor, Ind. I-2, Y1..3.60
Irvin, Pa. U5 .....3.60
Lackawanna, N. Y. B2 ..3.60
Munhall, Pa. U5 .....3.60
Niles, O. N12 .....5.25
Pittsburg, Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon, Pa. S3 .....4.00
So. Chicago, Ill. W14 ....3.60
Sparrows Point, Md. B2 ..3.60
Steubenville, O. W10 ....3.60
Torrance, Calif. C11 ....4.30
Warren, O. R2 .....3.60
Weirton, W.Va. W6 ....3.60
West Leechburg, Pa. A4 ..3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R. (19 gage)
Alabama City, Ala. R2 ..4.75
Dover, O. R1 .....5.65
Ind. Harbor, Ind. I-2 ....5.40
Mansfield, O. E6 .....6.65
Niles, O. N12 .....5.75
Torrance, Calif. C11 ...5.40

SHEETS, H.R. (14 ga., heavier)

High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken, Pa. A3 ..5.65
Ecorse, Mich. G5 .....5.95
Fairfield, Ala. T2 .....5.40
Fontana, Calif. K1 .....6.35
Gary, Ind. U5 .....5.40
Ind. Harbor, Ind. I-2 ....5.40
Ind. Harbor, Ind. Y1 ....5.90
Irvin, Pa. U5 .....5.40
Lackawanna (35) B2 ....5.40
Pittsburgh J5 .....5.40
Sharon, Pa. S3 .....5.40
So. Chicago, Ill. U5 .....5.40
Sparrows Point (36) B2..5.40
Warren, O. R2 .....5.40
Weirton, W.Va. W6 ....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.65
Ecorse, Mich. G5 .....7.10
Fontana, Calif. K1 .....7.50
Gary, Ind. U5 .....6.55
Indiana Harbor, Ind. Y1 7.05
Indiana Harbor, Ind. I-2..6.55
Irvin, Pa. U5 .....6.55
Lackawanna (37) B2 ...6.55
Pittsburgh J5 .....6.55
Sparrows Point (38) B2..6.55
Warren, O. R2 .....6.55
Weirton, W.Va. W6 ....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.35
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
Granite City,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

SHEETS, Enameling Iron

Ashland,Ky(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary,Ind. U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10.	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEET, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEET, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer, Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
New Britain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8: Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W. Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle,Pa.(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
Beechbottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn,Conn.(10)S15	10.75
Pawtucket,R.I.(11) N8	10.75
Pawtucket,R.I.(12) N8	11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

Wire, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora,Pa. A7	5.70	6.15
Duluth,Minn. A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.,Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
SparrowsPt, B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Palmer,Mass.W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt, B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill. L1	5.05
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8	5.10
Donora,Pa. A7	4.85
Duluth,Minn. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet,Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark, 6-8 ga. I-1	5.50
No.Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) N8	6.85
Trenton,N.J. R5	6.15
Worcester,Mass. A7	6.15
Worcester,Mass. T6	6.50
Worcester,Mass. W12	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE (16 gage)	An'l'd Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1)K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsville M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt, B2	10.35	12.25
Waukegan A7	10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill. L1	6.45
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth,Minn. A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Fine & Weaving (8"Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	141
Atlanta A11	144
Bartonville,Ill.(19) K4	144
Crawfordsville,Ind. M8	146
Donora,Pa. A7	141
Duluth,Minn. A7	141
Fairfield,Ala. T2	141
Houston,Tex. S5	149
Johnstown,Pa. B2	141
Joliet,Ill. A7	141
KansasCity,Mo. S5	153
Kokomo,Ind. C16	143
Minnequa,Colo. C10	147
Monessen,Pa. P7	146
Pittsburg,Calif. C11	161
Portsmouth,O.(18) P12	148
Rankin,Pa. A7	141
So.Chicago,Ill. R2	137
So.SanFran.,Calif. C10	161
SparrowsPoint,Md. B2	143
Sterling,Ill.(1) N15	141

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville,Ind. M8	132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill. L1	6.10
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth,Minn. A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½Ga. Col.

AlabamaCity,Ala. R2	127
Ala.City,Ala.,17-18ga.R2	214
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	134
Bartonville,Ill.(19) K4	131
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Johnstown,17ga.,6" B2	205
Johnstown,17ga.,4" B2	208
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	139
Monessen,Pa. P7	136
Pittsburg,Calif. C11	154
Portsmouth,O.(18) P12	138
Rankin,Pa. A7	131
So.Chicago,Ill. R2	127
Sterling,Ill.(1) N15	131

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	140
Williamsport,Pa. S19	150

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.35

RAILS

	Std. No. 1	Std. No. 2	All No. 2	Std. Tee Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...(16)	4.00
Lackawanna,N.Y. B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

NAILS & STAPLES, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M8	122
Donora,Pa. A7	118
Duluth,Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. 10	7.35

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

AXLES

Ind.Harbor,Ind. S13	5.60
Johnstown,Pa. B2	5.60

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	Mo	
18	4	1	....		1.505
18	4	2	....		1.650
20.25	4.25	1.6	12.25	3.535	3.675
19	4	2	7		2.460
18.25	4.25	1	4.75		2.125
18	4	2	9		2.445-2.45
13.5	4	3	....		1.6025
W	Cr	V	Mo		
6.4	4.5	1.9	5		0.96-0.965
6	4	3	6		1.190
1.5	4	1	8.5		0.810

Tool steel producers include:
A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes:
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. 36" wide.
(34) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035": 0.035" and heavier, 0.25c higher.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 YoungstownSheet&Tube

View of 14" —12"—10" Mild Steel Rod Mill

...When it's tonnage that counts

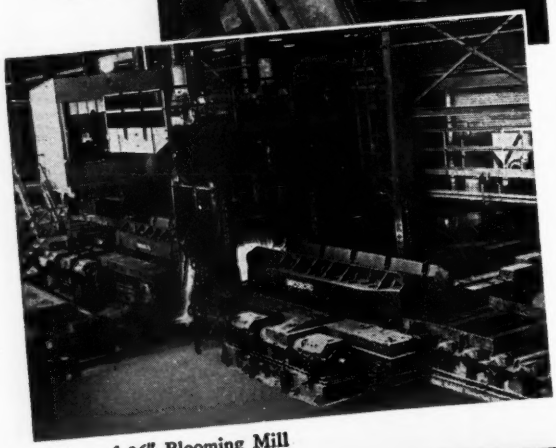
depend on

BIRDSBORO

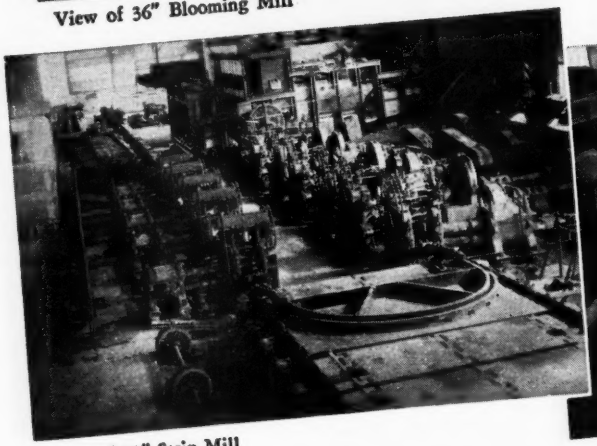
STEEL MILL MACHINERY

For producing Blooms, Billets, Rod, Strip and Merchant Bar.

Birdsboro engineering skill makes possible modern equipment like this that you'll find in leading mills mass-producing billets, rod, sheet, strip, plate and other products to meet today's critical demands. Whenever you find it necessary to modernize your present equipment or add to your facilities—it may be this year or the next—Birdsboro engineers will be glad to work with you on your individual problems.



View of 36" Blooming Mill



View of 10" Strip Mill

View of Merchant Mill

STEEL MILL MACHINERY

BIRDSBORO

STEEL FOUNDRY & MACHINE CO.

Birdsboro, Penna.

Designers and Builders of:
Steel Mill Machinery • Crushing Machinery • Rolls
Hydraulic Presses • Special Machinery • Steel Castings

Offices in:
BIRDSBORO, PA. AND PITTSBURGH, PA.

MM-16-51-R

STANDARD PIPE, T. & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	...	+0.5	+2.5	...
¼	6.0	0.42	28.5	26.5	...	+3.5	+5.5	...
⅜	6.0	0.57	23.5	21.5	...	+10.0	+12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.78	42.5	40.5	41.5	21.5	19.5	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 36½% on 3½", 4"; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜", Wheatland, Pa. W9, 2 points lower on ⅛", ¼", ⅜"; Following make ½" and larger; Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 4% on ⅛", plus 6% on ¼", plus 13% on ⅜" and 15.5% on 3½", 4"; Sharon, Pa. M6, plus 2.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Wheatland, Pa. W9, add 2 points on ⅛", ¼", ⅜", 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1¾ points lower on 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ⅛" and larger: Lorain, O. N3; Youngstown R2, and 15½% on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.63	19.62	23.09
2	13	21.82	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding	Plates Carbon Base	Plates Both	Strip Cold-Rolled Carbon Base	Strip Both Sides	Sheets Carbon Base	Sheets Both	Cu Base Both Sides
Stainless	10%	20%	10%	Sides	10%	20%	Sides
302 ...	....	....	....	....	19.75	26.24–27.50	77.00
304 ...	25.00	29.50	....	....	24.50	27.50–27.77	77.00
309 ...	30.50	35.00	....	....	....	....	....
310 ...	36.50	41.00	....	....	....	....	144.00
316 ...	29.50	34.00	....	....	26.00	35.92–36.50	....
317 ...	34.50	39.00	....	....	....	....	....
318 ...	33.50	38.00	....	....	....	....	....
321 ...	26.50	31.00–32.00	....	....	23.00	33.00	111.00
347 ...	27.50	32.00	....	....	24.00	33.50–33.83	130.00
405 ...	21.25	27.75	....	....	....	....	....
410 ...	20.75	27.25	....	....	....	....	....
Nickel.	33.55	45.15	41.00	54.00	....	....	....
Inconel.	41.23	54.18	....	....	....	....	165.00
Monel.	34.93	46.28	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	15
⅝-in. & ¾-in.	18.5
⅞-in. and larger ..	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter ...	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up Bolts	31

NUTS

	Reg.	Hvy.
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ¾-in..	12	6.5
⅞-in.-1⅛-in. ..	9	1
1⅛-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ¾-in..	16.5	6.5
⅞-in.-1⅛-in. ..	12	2
1⅛-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	28	22
⅝-in. & ¾-in..	23	17.5
⅞-in. & 1⅛-in.	19.5	12
1⅛-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller..	35	28.5
⅝-in. & ¾-in. ..	29.5	22
⅞-in.-1⅛-in.	24	15
1⅛-in. & larger..	13	8.5
		Light
½-in. & smaller		35
⅝-in. to ¾-in.		28.5
⅞-in. to 1⅛-in.		26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....48 & 10	
Plated finishes ....31 & 10	

HEXAGON CAP SCREWS

(1020 steel; packaged: per cent off list)

6 in. or shorter:	
½-in. & smaller	42
¾-in. through 1 in..	34
Longer than 6 in.:	
½-in. & smaller ...	26
¾-in. through 1 in...	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged: per cent off list)

No. 10 and smaller....	35
¼-in. diam. & larger..	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.85c

7/16-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers....List to list-plus-$1.

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
	CARBON	
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.25	36.75	31.50
303...	43.25	40.25	34.00
304...	43.25	38.75	33.00
309...	56.00	55.00	44.75
316...	57.00	59.00	49.25
321...	49.25	48.25	37.00
347...	53.75	52.25	41.50
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Bait., Types 301-347 sheet, except 303 and 309 E2.

Brackenridge, Pa., Sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & Structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 30.00-35.00

Toluol, one deg...26.00-33.00

Industrial xylol...25.00-33.50

Per ton bulk, ovens

Sulphate of ammonia..$32-$45

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums) ..17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron	Cents
98+% Fe, carlots..	17.00
Swedish, c.i.f. New York, in bags..	8.85-9.95
Electrolytic iron:	
Annealed, 99.5% Fe,	42.50
Unannealed 99 + % Fe	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns..	83.00-148.00
Aluminum: Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	32.50
Antimony	75.85
Brass, 20-ton lots.	30.00-33.25
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 20-ton lots	50.00
Copper: Electrolytic	37.25
Reduced	33.75
Lead	26.30
Magnesium	75.00-85.00
Manganese: Minus 100-mesh ...	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed ...	86.00
Nickel-Silver 5-ton lots	45.00
Silicon	38.50
Solder (plus cost of.. metal)	8.50
Stainless Steel, 302 ...	83.00
Zinc, 10-ton lots..	25.00-32.50
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh: 1000 lb and over ..	6.00
Less than 1000 lb..	6.15
98.8% minus 65 mesh: 1000 lb and over ..	4.15
Less than 1000 lb..	4.25
Molybdenum: 99.9%, minus 200 mesh	3.34
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvil.fur.	.$14.50-15.00
Connellsvil.fdy.	..17.00-18.00
New River foundry	...21.30
Wise county, foundry	..15.95
Wise county, furnace	..15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens.	.$22.75
Everett, Mass., Ovens New England, del.	*24.80
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens ...	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.42
Cincinnati, del.	25.85
Detroit, del.	26.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens..	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens ...	20.30
Birmingham, del	21.60
Philadelphia, ovens ...	22.70
NevilleIsland,Pa.,ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens St. Louis del.	25.40
Portsmouth, O., ovens.	23.50
Cincinnati, del.	25.12
Detroit ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.89
Flint, del.	26.59
Pontiac, del.	25.47
Saginaw, del.	26.92

* Or within $4.15 freight zone from works.

Accelerating heat input, lowering melt time, has become standard practice since the Mid-Continent Steel Casting Corp., Shreveport, La., has adopted the Airco-pioneered Decarb Process for steel production.

How TO INCREASE STEEL PRODUCTION

use less power–save more time

WITH AIRCO'S STEEL DECARBURIZATION PROCESS

Oxygen injected under the slag cover at 80 psi has become the answer to Mid-Continent's faster steel production.

Increased bath temperature—faster carbon elimination—lower power consumption . . . time saved per heat . . . gives Mid-Continent a product with the same normal chemistry, slag control and fluidity as they formerly received using ore. Additional workflow advantages are gained by the elimination of ore handling and storage problems.

Oxygen decarburization for faster heats may be put to work for you. The facilities of our Technical Sales Division may furnish you with the answers you need to know about this process for your use. If you are interested in obtaining further information, please address your nearest Airco office.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND

AN AIR REDUCTION PRODUCT

AIRCO®

DEALERS AND OFFICES IN PRINCIPAL CITIES

AIR REDUCTION

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY • AIR REDUCTION PACIFIC COMPANY

REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL

DIVISIONS OF AIR REDUCTION COMPANY, INCORPORATED

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡§		Carbon	Floor
New York (city)	6.40	7.11	8.55	7.05	...	6.49	7.29	9.28	6.37	6.74	7.98
JerseyCity(c'try)	6.10	6.91	8.25	6.75	...	6.19	6.99	8.98	6.07	6.44	7.68
Boston (city) ..	6.40	7.18	8.83	6.35	...	6.25	7.04	9.00	6.40	6.83	7.84
Boston (c'try) .	6.20	6.98	8.63	6.15	...	6.05	6.84	9.20	6.20	6.63	7.64
Phila. (city) ..	6.04	6.97	8.35	6.33	7.11	6.27	7.16	8.97	6.09	6.30	7.29
Phila. (c'try) ..	5.79	6.72	8.10	6.08	6.86	6.02	6.91	8.72	5.84	6.05	7.04
Balt. (city) ...	5.74	7.00	8.40	6.23	...	6.21	6.83	...	6.33	6.33	7.57
Balt. (c'try) ..	5.54	6.80	8.20	6.03	...	6.01	6.63	...	6.13	6.13	7.37
Norfolk, Va. ..	6.78	...	...	...	...	6.04	7.30	...	6.30	6.30	7.15
Richmond, Va. .	5.74	6.57	8.38	6.14	...	5.91	6.59	...	6.72	6.86	8.00
Wash. (w'hse) .	6.05	7.26	8.49	6.50	...	6.50	7.26	...	6.60	6.65	7.86
Buffalo (del.) ..	5.74	6.52	8.29	6.06	...	5.72	6.65	10.65††	6.00	6.23	7.55
Buffalo (w'hse).	5.54	6.32	8.09	5.86	...	5.52	6.45	10.45††	5.80	6.03	7.35
Pitts. (w'hse)..	5.50	6.32	7.85	5.59	6.90	5.45	6.20	10.30††	5.65	5.85	6.89
Detroit (w'hse).	5.75	6.47	8.12	5.76	7.15	5.76	6.64	9.13	6.09	5.88	7.21
Cleveland (del.)	5.74	6.52	8.16	5.85	7.18	5.76	6.60	8.91	6.15	6.02	7.40
Cleve. (w'hse)..	5.54	6.32	7.96	5.65	6.98	5.56	6.40	8.71	5.95	5.82	7.20
Cincin. (w'hse).	5.84	6.38	8.29	5.77	...	5.75	6.64	...	6.09	6.14	7.28
Chicago (city)..	5.74	6.52	8.05	5.69	...	5.67	6.50	10.30††	5.85	5.90	7.09
Chicago (w'hse)	5.54	6.32	7.85	5.49	...	5.47	6.30	10.10††	5.65	5.70	6.89
Milwau. (city) .	5.90	...	8.21	5.85	...	5.83	6.88	10.46††	6.01	6.06	7.25
Milwau. (c'try)	5.70	...	8.01	5.65	...	5.63	6.68	10.26††	5.81	5.86	7.05
St. Louis (del.)	6.02	6.80	8.33	6.56	...	5.95	6.88	10.58	6.22	6.27	7.46
St. L. (w'hse)..	5.82	6.60	8.13	6.36	...	5.75	6.68	10.38	6.02	6.07	7.26
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans.City(w'hse)	6.29	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90‡	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm(w'hse)	5.60	6.40	6.75‡	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city).	6.50	8.30‡	9.45	6.60	10.65	6.45	8.35	...	6.50	6.50	8.75
L. A. (w'hse)..	6.30	8.10‡	9.25	6.40	10.45	6.25	8.15	...	6.30	6.30	8.55
Seattle-Tacoma.	7.02	8.64	9.60	7.54	...	6.70	9.19	10.35	6.54	6.90	8.73
San Francisco..	6.62	7.88‡	9.10‡	6.43	...	6.45	8.20	11.15	6.32	6.37	8.50

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 16 gauge; †† as annealed; §§ 15 gage. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; ‡—500 to 1499 lb; §—450 to 1499 lb; ¶—3500 lb and over; ¶—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%: Spot	nom.
Long-term contract	$20.00-24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	30.00-31.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	nom
Rhodesian	
45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 21.75c per lb of contained Cr c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 23.25c per lb of contained Cr. C.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 16.35c per lb of alloy; ton lot 17.2c; less ton lot, 18.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 21.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium ton lot $1.10, less ton $1.12. Delivered. Spot add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.00c per lb of contained Si; packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

Note: Current prices on zirconium, calcium and briquetted alloys appeared on page 167, Mar. 3 issue; manganese, titanium and "other" ferroalloys, page 219, Mar. 10. Refractories prices were published on page 167, Mar. 3.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.5c per lb of contained Si, carload packed 18.7c, ton lot 19.65c, less ton 20.7c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe). C.l. lump, bulk, regular 20.0c per lb of Si, c.l. packed 21.2c, ton lot 22.1c, less ton 23.1c. Add 1.5c for max, 0.10% calcium grade. Deduct 0.4c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe.) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 200 to 1999 lb 11.65c, smaller lots 12.15c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12 % max., C 3-3.5% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max., C 0.5-1% max), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Boresil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

TUNGSTEN ALLOYS*

Ferrotungsten: (70-80%). 10,000 lb W or more, $5.00 per lb of contained W; 2000 lb W to 10,000 lb W, $5.10; less than 2000 lb W, $5.22.

Tungsten Powder: Carbon Reduced; (W 98.8% min) 1000 lb or more, $6.00 per lb of contained W, less than 1000 lb W, $6.15.

* Government ceiling prices, effective May 7, 1951, f.o.b. Niagara Falls, N. Y., basis.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

Mar. 13	$43.00
Mar. 6	43.00
Feb. 1952	43.00
Mar. 1951	44.00
Mar. 1947	37.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Grade 1 Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	—10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restriction on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.
(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.
(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.
(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.
(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.
(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.
(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or/steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses, otherwise, ceiling shall not exceed that for Grade 14.
(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.
(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery.	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of $1.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:
Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.
Bethlehem, Pa., 52c; Birmingham 50c; Brackenridge, Pa. 53c; Buffalo, 83c; Butler, Pa., 65c.
Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.
Coatesville, Pa., 50c; Conshohocken, Pa., 20c.
Detroit, 95c; Duluth, Minn., 50c.
Harrisburg, Pa., 51c; Houston, 57c.
Johnstown, Pa. 75c.
Kansas City, Mo., 78c; Kokomo, Ind., 51c.
Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c.
Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c.
St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O. 51c.
Warren, Pa., 75c; Weirton, 70c.
Youngstown, 75c.

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new factory:	
Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	55.00

* F.o.b. shipping point.

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The Metal Market

Continued improvement in demand-supply situation in major nonferrous metals threatened by current wage disputes. Government decisions are awaited in several cases

LABOR problems will be critical over the months immediately ahead. Improvement which has been attained in demand-supply balance of major nonferrous metals would be lost quickly should workers and producers become deadlocked in present negotiations within the industry.

Representatives of brass workers affiliated with the International Mine, Mill & Smelter Workers are discussing reopening wage negotiations with the American Brass Co. The Waterbury branch of American Brass, Scovill Mfg. Co., the Thomaston Division of Plume & Atwood Co., and several smaller companies are waiting for a Wage Stabilization Board ruling in the brass industry dispute. The unions involved are affiliated with the CIO United Auto Workers.

A special panel of the WSB held hearings last week with the International Council of Aluminum Workers, AFL, demanding a 25-cent per hour increase and other economic demands at Aluminum Co. of America's six plants at which the union has jurisdiction.

Wage Stabilization Board is studying three lead and zinc mining dispute cases for final and binding decision. Parties to the disputes are: Combined Metals Reduction Co., New Park Mining Co. and United States Smelting, Refining & Mining Co., all in the Salt Lake City, Utah, area, and United Steelworkers of America, CIO. All the cases involve the same basic issues of a general wage increase and the establishment of a job evaluation program.

Three other cases in the same area and involving the same union have been deferred for further consideration. Parties in the disputes submitted the cases for recommendation only. Companies involved are: Park Utah Consolidated Mines Co., Silver King Coalition Mines Co. and Chief Consolidated Mining Co.

Copper Output Goals Raised

Government expansion goal for copper has been raised. Achievement of the new goal would provide 2,270,000 net tons of refined copper beginning in 1955, an increase of 239,000 tons over the 1950 supply, says Ralph S. Trigg, deputy administrator, Defense Production Administration for Program and Requirements. Establishment of the goal permits the DPA Office of Resources Expansion and Defense Materials Procurement Agency to provide government assistance to obtain the required production.

The United States consumed 2,163,000 net tons of copper in 1950. By 1955 demand is expected to increase to 2,270,000 tons, including military, atomic energy and civilian uses, exports and stockpile requirements.

Domestic production from present sources amounted to 921,000 tons in 1950. This production is expected to increase to about 1 million tons in 1952. Due to the depletion of some mines, however, it is expected to decline to 920,000 tons by 1955.

Our supply of copper available in 1950 was augmented by 474,000 tons of old scrap and 636,000 tons of imports for a total supply of 2,031,000 tons. By 1955, the availability of scrap is expected to decline to 450,000 tons, but this will be partly offset by an increase in imports which are expected to total 650,000 tons. The total amount of copper expected to be available in 1955 will amount to about 2,020,000 tons from the above sources, plus an additional 250,000 tons from production resulting from the government aid program under the expansion goal.

Achievement of the expansion goal by 1955 will result in a substantial balance of supplies of copper to meet the anticipated requirements, Mr. Trigg says.

Aluminum Supplies Increase

Inventory restrictions on aluminum will be eased soon. You will be allowed to maintain a 60-day supply instead of being restricted to a 45-day supply as at present.

In addition, the government will allow users to average their stocks of all shapes and forms in determining the size of their inventories, says William C. Truppner, assistant DPA administrator. Up to now the inventory restrictions applied to each aluminum item individually.

Supply of aluminum is increasing steadily and expansion of the industry has reached the point where proposals for further expansion of the industry here or additional contracts for foreign metal are meeting considerable opposition.

NPA estimates that total supply of aluminum available for allotment in 1952 from all sources will be about 1.4 million tons compared with 1,183,000 tons in 1951.

Production of primary aluminum and shipments of sheet, plate and foil "got off to a fine start in 1952," says Donald M. White, secretary, Aluminum Association, New York. Primary aluminum output in January, amounting to about 76,934 tons, increased 6.2 per cent over December and 13.2 per cent over the January, 1951, figure.

Zinc Controls To Ease

Free world supply of zinc is improving so much that International Materials Conference may consider abandonment of the allocation system of the metal after July 1, according to a report of the Copper-Zinc-Lead committee of the conference. The committee allocated 487,650 metric tons of zinc to member countries for the first quarter of 1952 and expects to allocate about 508,000 tons for second quarter.

National Production Authority relaxed slightly its controls on allocation of slab zinc. The metal now is allocated quarterly as well as monthly. This step is designed to give exporters more time for arranging shipping schedules and other details.

Domestic production of slab zinc will be increased by about 9250 tons annually and pig lead by about 850 tons under an agreement reached by DMPA and American Smelting & Refining Co. The company will construct concentrating facilities capable of handling 1000 tons of ore daily at its Van Stone mine property in Stevens county, Washington, at a cost of $1,719,000.

NPA Rules on Tin Can Scrap

An important source of copper is found in mine water, runoff in and about copper mines. To recover this copper, producers have used shredded tin cans on which the copper precipitates. Because of a growing shortage of tin cans, National Production Authority issued a new order, M-98, directing the flow of used tin cans to shredding plants where they are prepared for use in producing copper from this source.

Order M-98 is effective only in the following counties: Kern, Los Angeles, Orange, San Bernardino, Santa Barbara, Riverside, Ventura, San Diego and Imperial, California; Maricopa and Pima, Arizona.

In recent months, part of this regular supply of scrap cans was diverted to steel mills. Copper mines were faced with a shortage of about 3000 tons of scrap a month. Since 1 ton of copper can be obtained by precipitating 1.25 tons of shredded cans, this would amount to a loss in copper production of about 2400 tons a month.

The order provides that collectors of used cans in the specified counties must dispose of their cans to shredding plants, or to a producer engaged in precipitating copper. The shredding plants must in turn make their product available to copper producers.

Mineral Finds Certified

Two discoveries of strategic minerals in the United States were certified by Defense Minerals Exploration Administration. These discoveries are the first to be formally certified in the government's program to develop the mineral resources of the country. Certification of half a dozen more discoveries, including minerals highly strategic to the national defense, are expected in the near future.

The first discovery certified was on the property of Westmoreland Manganese Corp., near Batesville, Ark., where it is claimed sufficient manganese was discovered to justify a large scale operation. The second certification was at the Reid-Mary mine of Pitt Mica Corp., near Franklin, N. C., where mica was found.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley, Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c, 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, East St. Louis; high grade 20.85c, delivered.

Lead: Common 18.80c; chemical 18.90c; corroding 18.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 50.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 50.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $207-$210 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs). $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 88.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53, cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze 95%, 41.30; 90% 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85%, 43.05.

Wire: Yellow brass 38.57, commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44.

(Base prices, effective Dec. 26, 1951)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 28.545; 30,000 lb lots, 28.67; l.c.l., 29.17. Weatherproof, 100,000 lb, 30.35; 30,000 lb, 30.60; l.c.l., 31.10. Magnet wire del., 15,000 lb or more, 34.50; l.c.l., 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths of Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R-317-T4	—Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.0188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $24.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $24.00 per cwt. Traps and bends: List prices plus 65%.

ZINC

Sheets 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 25.50-26.50c; over 12-in., 25.50-26.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Mar. 1-13	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. 1-29	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00
Feb. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
1951								
Dec. Avg.	24.50	18.80	19.50	103.00	19.00	50.00	56.50	88.00
Nov. Avg.	24.50	18.80	19.50	103.00	19.00	44.56	56.50	88.00
Oct. Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Sept. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 28.00c; 5 tons and over 28.50c; 1 to 5 tons, 29.00c; less than 1 ton 29.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb. 75.50c; 3000 to 10,000 lb, 76.50c, 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb. to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.6c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unsweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 19.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb, or a flat price of 11.25c a pound of battery plates. Used storage batteries (in boxes) drained of liquid, 7.65c for 15,000 lb or more; 7.45c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 17.25c in lots of 20,000 lb or more; 16.50c in lots under 20,000 lb.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

Semifinished Steel . . .

Semifinished Prices, Page 145

Youngstown—Sharon Steel Corp. has taken off two open hearths at its Roemer Works at Farrell, Pa. It is the first basic steel producer to curtail steelmaking because of slower demand. Sharon officials say military orders are not coming through fast enough to replace dwindling civilian business.

Sheets, Strip . . .

Sheet and Strip Prices, Page 145 & 146

Cleveland — Sheetmakers note a pickup in second quarter inquiry for cold-rolled sheets from the automotive industry. This follows upon the upping of the auto industry's NPA allotment permitting production of 1,050,000 passenger cars in the period, increase of 120,000 over the original schedule.

Expectations are the bulk of this new sheet business will go to the smaller producing interests with open space in their second quarter rolling schedules. The larger steel producers, as a general thing, are booked full into third quarter and cannot accommodate much additional tonnage.

Easier supply conditions continue in evidence in the sheet market, one medium sized producer, Sharon Steel Corp., having cut operations over the past week or so because of slack demand. Easing of restrictions on automobile production with resulting pickup in requirements, however, is seen by some in the trade as possibly signalling a turn for the better in the market. Normal seasonal pickup in requirements also is seen as providing a check on the downtrend over coming weeks.

Third-quarter order books have not yet been opened by the sheetmakers except for military tonnage, but indications are producers will begin to accept tonnage for the period within the next week or so. Full order books are expected for the period, though booking may be at a slower pace than in preceding quarters with CMP allotments more closely in balance with production than at any time since the system was put into effect last July.

Boston — Cold-rolled sheets produced at the Fairless Works, Morristown, Pa., will have a rail freight advantage of $2.18 per ton, delivered Boston, on 40,000 pound shipments. Rate per 100 pounds, exclusive of 3 per cent tax, is 56.68c compared with 67.58c from Sparrows Point, Md. Bethlehem Steel's plant at Sparrows Point has held a freight advantage, notably over the Pittsburgh district plants. Rate on 80,000 pounds, rail shipments, is 43.60c per 100 pounds, Morrisville, and 54.50c Sparrows Point, exclusive of tax.

By third quarter volume shipments from Morrisville will be available, probably some tonnage coming through in late second quarter.

Mills in some cases are booking specialties, including straight chromium stainless and silicon for third quarter. Decontrol of straight chromium stainless has not moved heavier volume of that grade in this territory.

New York—Sheet sellers will open books shortly for third quarter on the

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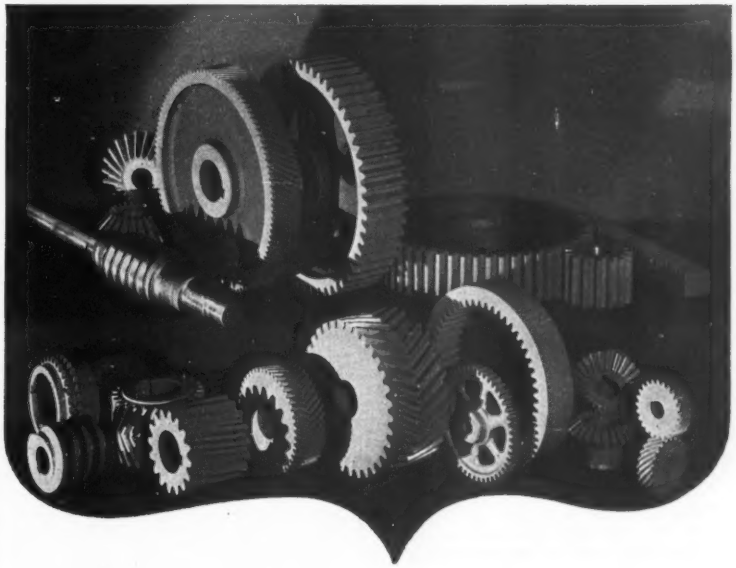
an ounce to 20,000 lbs.



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major grades. Demand is spotty. Some of the smaller mills are beginning to schedule tonnage for third quarter delivery, and on some specialties producers generally have long since opened their books for the period. This is due in some cases to the long lead time required and in others to the sluggishness in demand. Low grade silicon sheets have been more or less a drug on the market for some time and producers have been accepting delivery on about any position desired. However, this is not true of the high grade silicon sheets which are in strong demand, especially for power and distribution transformers. Stainless sheets are booked well ahead, partly because of extended lead time and, in the case of the straight chrome grades, because of the desire by producers to get as much tonnage on their books as possible.

Philadelphia—Loosening up of government restrictions on consumer durable goods production may stem the easing in demand for sheets and strip. It is too early, however, to estimate to what extent demand will revive. Spot openings in mill schedules as result of deferments and cancellations are still noted.

Pittsburgh—While mills are booked solid for second quarter, demand pressure for cold-rolled has taken a nosedive due to sluggish conditions in consumer durables and automotive industries. Mills expect to start booking third quarter tonnage within the next week or two. Some spokesmen think decontrol of at least secondary products will be forthcoming by third quarter.

Birmingham—Some easing is reported in demand for flat rolled products in other areas, but no marked trend in that direction is found here. Second quarter books are full. Some proffered business was turned away.

Los Angeles—Stretching-out of aircraft production schedules has reduced steel requirements of subcontractors. Prime contractors have started pulling subcontracted work into their own shops.

Plates . . .

Plate Prices, Page 145

Boston—Tank shops are booking more orders. They are getting heavier tonnages of light plates. Second quarter schedules on heavy plates, notably quality carbon grades, are filled. Demand is heavier from structural shops. Shipbuilding takes more tonnage and yard backlogs are heavier, notably Bethlehem's Quincy yard where recent bookings included two 45,000-ton, one 29,000-ton, and one 16,200-ton tankers.

Philadelphia—Consumers of light gage plates are having little difficulty obtaining sufficient tonnage for their needs, especially where they can use strip plate. Heavy gage material, however, is in as tight supply as ever. Lukens Steel Co., Coatesville, Pa., postponed making repairs to its 112-in. and 120-in. mills. Originally scheduled for April, work has been delayed until late in the year.

Pittsburgh—Light plate is in good supply here due to rollings on district continuous hot-strip mills. Heavier material produced on conventional plate mills is extremely tight. Second quarter books are filled and un-

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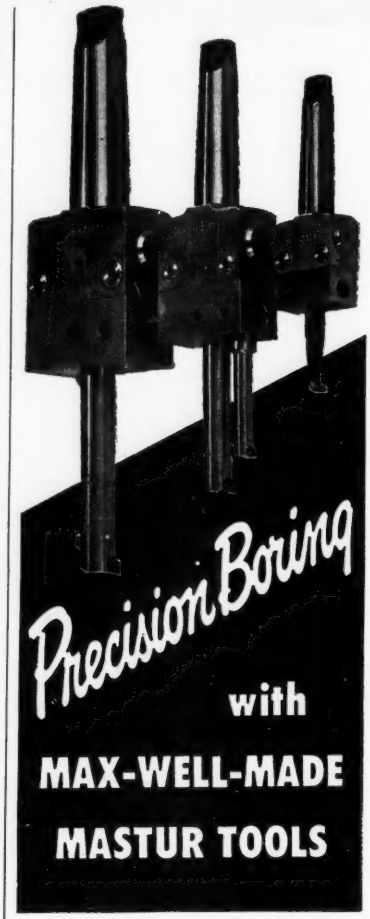

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207-MC

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cashed CMP tickets are seeking open rolling time. Mills see substantial carryover into next quarter.

Seattle—Portland, Oreg., received bids Mar. 14 for about 15,000 tons of plates for the 25.5 mile Bull Run conduit, 52 to 66-in. in diameter. Several tank jobs are up for early action. NPA has allotted 100 tons for first quarter and 350 tons for second quarter for a 2-mile supply line for Everett, Wash.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 145

Boston—Relatively large ratio of concrete reinforcing bar tonnage booked is for forward delivery, extending nearly one year for some substantial lots. Direct buying is included. New inquiry is mounting, led by bridge substructures taking approximately 3000 tons.

Seattle — Reinforcing bar order backlogs have been reduced the last 60 days. Small jobs, offering freely, are being accepted if they fit into schedules.

Steel Bars . . .

Bar Prices, Page 145

New York—Despite easing supply conditions in some major products, especially light flat items, bars continue tight. This is especially true of cold-finished bars, although hot carbon is scarcely a step behind. Hot bar producers are booked up solidly, throughout second quarter. Books will soon be opening for third quarter. Most producers think the movement in the third quarter will be down a bit from that in second quarter, because of vacations and other seasonal influences. Certain others, however, do not string along with this idea completely. They believe relaxing of restrictions on consumer durable goods will have a bolstering effect. Further, the trend in military production will still be upward.

Philadelphia—Evidences of easing are beginning to appear in hot-rolled bars. Most mills are booked tightly on all grades, but here and there a loosening up in tonnage appears. One district consumer recently received a "bonus" from a midwestern producer whose business was adversely affected by a drop in demand for steel from agricultural equipment manufacturers. A Pittsburgh district mill is soliciting tonnage more actively in the East as new facilities become available. However, the general overtone of the market is strong, especially in the larger sizes required for shell work.

Boston—Larger sizes of carbon bars excepted, a slight easing in some grades is developing. Inventories of bolt and nut shops are heavier. Indications are some will not specify fully against third quarter allotments. Warehouses are taking in more intermediate sizes. Forge shops are pressing for cold-finished. Converters, sold into third quarter, are taking all the hot-rolled tonnage allocated.

Pittsburgh—No third quarter business is being entered here yet but the mills plan to open their books for defense tonnage shortly. Demand has eased somewhat, but numerous uncashed CMP tickets for second quarter are moving about the area. Mills

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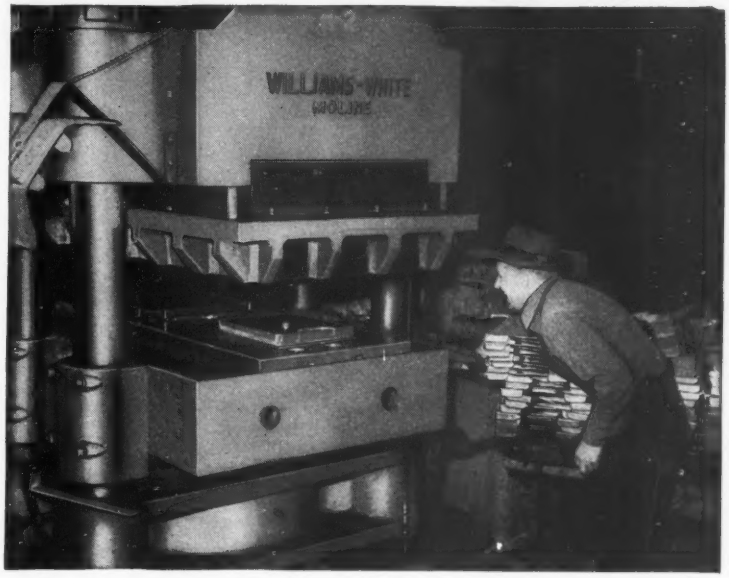

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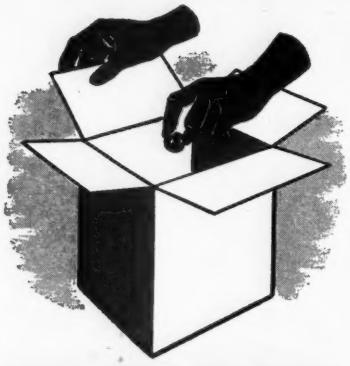

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expect large carryover tonnage into third quarter. Hardest sizes to secure here are those over 1½-in. in forging and cold-finished grades

Cleveland—The bar mills are under heavy pressure for tonnage and there is little prospect of any material easing in supply conditions for months to come with shell and other defense requirements heading toward a peak. Large-size bars are harder to obtain than smaller sizes. Forging quality billets and bars are in extremely tight supply, though the forge shops note some slight improvement since mid-February. Many shops, however, still find it impossible to place all of their first and second quarter CMP tickets. The tight supply pinch is aggravated by the rising demand for quality bars in the production of shells. Forge shops are heavy consumers of the same quality steel as is used in producing shells which are being turned out in increasing volume from month-to-month. Where possible, the forge shops are using other than forging quality steel.

Chicago—Improving outlook for farm equipment is reflected in stronger demand for bars. Mills see little likelihood overall demand for bar mill products will ease to the same extent as some other products. Shortage of forging bars and billets is acute and there is a deficiency of large sizes of cold-finished bars. Increasing requirements for shell steel is the biggest single factor for tight supply.

Tubular Goods . . .

Tubular Goods Prices, Page 149

Boston—Merchant pipe distributors are not taking all the second quarter tonnage allocated. Buttweld is mostly affected. Scattered price shading in the way of discounts is reported. Seamless and pressure pipe demand is maintained. Most producers are offering slightly more galvanized pipe for May and June. Light wall welded tubing supply exceeds demand.

Los Angeles—Pressure from consumers for pipe is slackening. Lower construction activity has put jobbers out of the market for black pipe.

Seattle—Cast iron pipe inquiry is firmer. Many calls include alternatives. Several government projects are pending, including an unstated tonnage for the Navy base, Kodiak, Alaska.

Wire . . .

Wire Prices, Page 147

Chicago—Jobbers of merchant products have sufficient stocks to supply demand through May. In many cases they are not taking full quotas from mills. Barbed wire and fence posts are scarce. Building mesh and mesh for pipe and paving fall short of requirements. Cold heading wire business is well maintained but consumption of spring wire for auto use is off about 20 per cent. Demand from furniture makers for spring wire and nails is fair. Orders for nails are in good volume.

Boston—Decontrol of finished wire products is favored in some quarters as supply equals or surpasses demand. Some mills have trouble accumulating enough orders for capacity production in May. There are openings in high carbon specialties. Deferred shipments and cancellations appear at the same time some consumers lack tickets for requirements.

New York—Openings in May wire product schedules reflect a lag in buying. New orders are below capacity. Light cold-rolled specialties are easier and oil tempered spring wire demand is slow. Rope departments are operating with smaller backlogs at 65 to 70 per cent of capacity. Manufacturers' wire buying is spotty with some consumers' inventories substantial. Woven fabric requirements tend to ease slightly. Rod supply is ample in most cases.

Birmingham—Most items remain in short supply. An exceptionally mild winter has sustained agricultural demand.

Structural Shapes . . .

Structural Shape Prices, Page 145

Cleveland—Lifting of restrictions on certain classes of construction will not likely be felt by fabricators for several months. Generally, it is thought distress labor areas will get preference in government steel allotments. This area is not a distress point. Further, fabricators feel much potential work may not develop at all now that the general business outlook is changed from that prevailing months ago when many projects were first conceived. Currently, fabricators are competing actively for the few new jobs coming before the market.

Boston—More fabricated structural steel volume is being estimated, including six sections, 25,000 tons, elevated expressway, Boston, closing before May 1. Three of these are rebid projects. Easing of building restrictions has released some tonnage. Direct defense structures account for 10,000 tons. Prices quoted for fabricated steel are slightly lower with competition keener among smaller shops.

New York—Construction or remodeling of 35 structures in the New York City area and northern New Jersey, having an estimated value of almost $18 million, has been approved by Washington. Of the 35 projects, four have estimated value of more than $1 million. A store, to be built by Webb & Knapp Inc. in Manhattan, will cost $4,020,000. A shopping center in Yonkers, to be built by Cross Properties Inc., will cost $3,600,000. The other two outstanding projects approved are a $1,885,000 office building for the New York Telephone Co., Jamaica, L. I., and a $1,247,500-store for A.B.R. Corp. Newark, N. J.

These projects reflect action by the government loosening construction work, especially in districts where unemployment in the building trades is severe. The 35 projects are a part of 105 commercial building projects, having estimated total cost of $53,678,435, approved for action in seven areas throughout the country.

Philadelphia—Due to easing of governmental restrictions on building, fabricators not only anticipate some pickup in demand but rejuvenation of order backlogs. Various orders

long since booked are being given the green light by Washington for the first time. Actually, CMP tickets are coming through on projects entered as far back as last July.

Pittsburgh—District producers expect strong demand for shapes into third quarter due to additional allotments by NPA for commercial and industrial construction during second quarter. This with proposed construction of 600 religious, community and municipal projects during third and fourth quarters will help sustain capacity production at district mills.

Seattle—Fabricating plants are engaged close to capacity but order backlogs are down. Third quarter business is being figured. Considerable tonnage is involved in government and military projects. Among sizable contracts pending are Washington state bridges. Shape supply situation is slightly improved.

Pig Iron . . .

Pig Iron Prices, Page 144

Philadelphia—Pig iron supply is not plentiful but, nevertheless is getting easier. This is ascribed not only to lagging activity in gray iron foundries but to the further easing in cast scrap prices which is causing consumers to again turn to this material at the expense of iron. Trading in foreign iron is virtually nil although some tonnage is still coming in against old orders, including two shipments of Spanish iron now enroute.

Boston — Armament contrasts placed in this area, with few exceptions, involve a limited volume of castings. Foundry melt is not benefited by some of the larger contracts placed with the textile and shoe equipment industries. Most defense requirements call for steel. Pig iron reserves are satisfactory. Second quarter price for Mystic iron will be announced shortly.

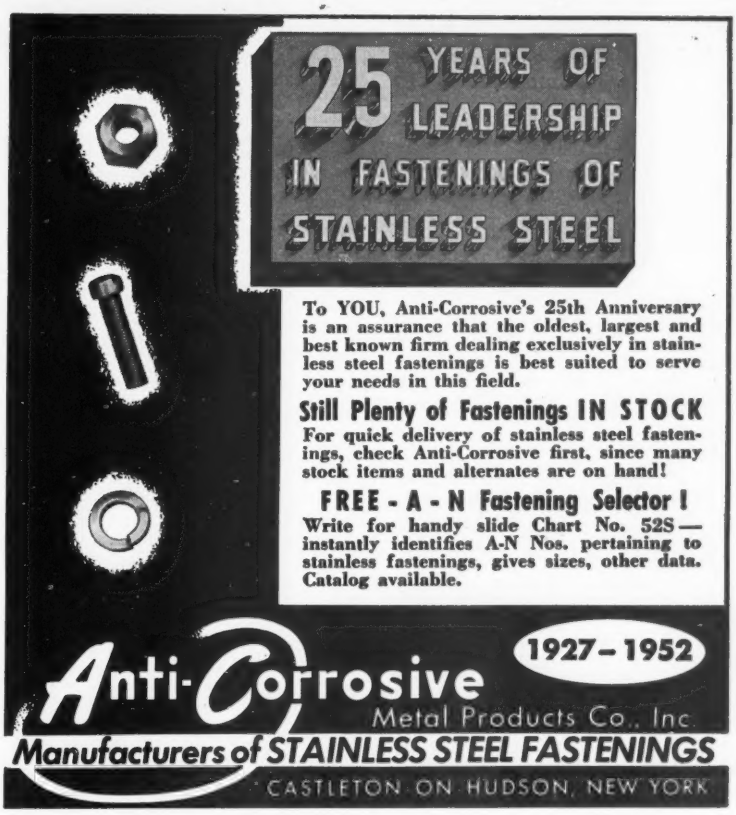
New York—District consumers assert they are not having much difficulty obtaining all the iron they require. The supply situation isn't easy, but pressure for tonnage is off.

Buffalo—Major interest in the pig iron market last week was directed to the blowing in of a new blast furnace at Bethlehem Steel's Lackawanna plant. The unit was placed in operation on basic iron. Merchant market iron supplies continue tight. Most of the local iron production is going direct to steelworks.

Pittsburgh—Easing in demand for merchant iron continues but a definite pickup is expected within 30 to 60 days in plumbing and heating castings. Requests are coming from without the district for tonnage.

Cleveland—Pressure is off merchant iron sellers with the light castings shops operating on curtailed schedules, but there is no surplus iron in the area, the heavy foundries on defense work taking up the slack from the light shops. Demand for foreign iron has about dried up, melters declining to pay premium prices with domestic iron more freely available. Some spotty improvement in operations is noted in light castings production, reflecting seasonal pickup.

Chicago—Improving operations of gray iron foundries are exerting a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tightening effect on pig iron demand. The rising melting rate applies to jobbing shops serving essential industries and captive shops in the farm equipment industry. Those jobbing shops closely allied with automobiles and consumer goods are likely to become busier. Inland Steel relighted its Indiana Harbor No. 5 blast furnace Mar. 12, making 41 of the district's 42 stacks in operation

Birmingham—Pig iron remains in tight supply. Demand pressure is not as great as it was a few weeks ago.

Scrap . . .

Scrap Prices, Page 152

Philadelphia — Shortage of high grade open hearth steel scrap continues. The lesser grades, however, are in better supply than a few weeks ago and the mills in general are in somewhat more comfortable position. They are more selective with respect to acceptances. Electric furnace scrap is ample and in the cast grades cupola remains easy pricewise as well as in point of supply. Heavy breakable and good drop broken cast are in firm demand.

Pittsburgh—Dealers are more optimistic regarding supply and demand for open-hearth scrap. Collections are good and plant inventories are holding their own, in many cases improving. Good electric furnace material is hard to get with one dealer going to the East coast and paying high freight rates to move the material in here. The market is practically dead for cast material but rumors of price shading of $2 a ton cannot be verified.

Buffalo—All three of the leading mill consumers in this area are receiving substantial tonnages of scrap under new allocation orders placed with dealers. One mill is working on very limited inventory. Buying interest in cast grades is negligible with prices still ranging from ceiling levels to slightly lower.

Cleveland — Trade sentiment appears slightly stronger in the scrap market this week. Dealers seem encouraged by reports of quickening activities at some foundries that have been on curtailed schedules for some time past. Heavy supplies of cast grades still overhang the market but except for freight absorption no price cutting is reported. The open-hearth grades of scrap are moving steadily to the mills. However, buyers are increasingly particular with respect to specifications despite the fact supplies are none too plentiful. Production scrap is not coming out in the volume of some months back because of the curtailment in civilian goods manufacture.

Detroit—The strike on the New York Central System slowed scrap movement briefly but traffic returned to normal by midweek. Best quality open-hearth material continues in strong demand and dealers are careful to see there is no cause for rejection. The cast market is dragging, but prospects are brightening for a few gray iron shops. Traders are hoping for a livelier demand.

Chicago—Steelmaking scrap inventories average between two and three weeks. Only two months ago some mills were struggling along with stocks as low as one or two days. Allocations are fewer in number and involve less tonnage. Easier tone is observed in electric furnace grades. Blast furnace items are on the sluggish side. Cast iron continues abundant and is moving below ceiling prices.

Birmingham—Scrap supplies are reasonably satisfactory although melting steel is still relatively short. Not much demand for cast grades is reported.

Seattle—Recent drop in cast scrap prices stimulated shipments of steel grades, which, large buyers report, are coming to tidewater in greater volume. Mill managements believe the winter supply crisis is over and that from here on there will be ample stocks. Inventories of cast iron have increased, the largest buyer in this area being out of the market. Cast is quoted $5 per ton under the government ceiling level.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 149

Washington—Members of the OPS Beehive Coke Industry Advisory Committee last week stressed need for a pricing regulation permitting them to reflect in future prices possible increases in the cost of coal.

Industry pricing is under SR 13 which provides that beehive coke makers increase their GCPR ceilings by the same amount the delivered cost of their raw materials increased after Jan. 25, 1951, if it did not increase their 1950 operating margins.

SR 13 expired June 30, 1951, but was extended to May 31, 1952 pending a tailored regulation still to be issued. Increases in delivered costs of raw materials, however, may be figured only up to Dec. 31, 1951.

Discussing future possible increases in raw material costs, OPS officials indicate the OPS industry earnings standard, based on earnings against net worth, would not be practical. This provides that ceilings be increased for any industry not making 85 per cent of the earnings it achieved during the best three out of four years from 1946 to 1949. As an alternative, employment of profit—figured as a percentage on sales—as a yardstick for establishing earnings might be acceptable to OPS.

Cleveland—With foundry opera-

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tions showing signs of seasonal quickening, merchant sellers are encouraged to anticipate a surge in demand for oven foundry coke over coming weeks. Currently, coke supplies are adequate to meet all demands with foundry inventories substantial. Some offers of beehive coke at lower prices are rumored here but with plenty of oven-grade material available the foundries are not paying too much attention to these offers. So far as can be determined oven coke prices are firm with the trade watching the coal industry for developments on the labor front.

Warehouse . . .

Warehouse Prices, Page 151

New York—With receipts of most products improved warehouse inventories are slightly up, including cold-rolled carbon sheets and hot-rolled strip. Larger tonnages in structurals and plates are confined to lighter sizes. The intermediate ranges in bars are in better supply also. Demand is strong, but more rational.

Philadelphia — Leading warehouses are beginning to build up inventories in products other than sheets and strip. Certain bar sizes and light gage plates are becoming a little more plentiful.

Pittsburgh — Mill shipments to warehouses have not been too good of late. Some distributors desperately need many sizes of hot-rolled and cold-finished bars and structural shapes. Flat-rolled sheets and the lighter gage plates are in good supply. Some easing in customer demand is noted.

Cleveland—Warehouse stocks are improving with shipments from the mills steady in most products. Sales are holding up but more selling on the part of distributors is necessary to move tonnage. This is especially true of the light, flat-rolled items. Heavy plates, large-size bars, rounds, squares and flats are items in chief supply stringency.

Birmingham — Warehouse stocks are more satisfactory. Shipments are heavy. 'Small inventories are being built.

Los Angeles — Fabricators report distributors are offering immediate shipment of carload lots of hot or cold-rolled flat products.

Seattle—View is not unanimous among warehouse operators that steel supply is easier. Numerous items still are scarce. Current surpluses are largely in odd sizes and off-grades. Stocks generally are low with demand continuing strong.

Rails, Cars . . .

Track Material Prices, Page 147

New York—Domestic freight car awards in February totaled 6120 against 5338 the preceding month, according to the American Railway Car Institute and the Association of American Railroads. Order backlog Mar. 1 was 118,900, compared with 120,251 at the beginning of the preceding month. February deliveries comprised 7358 freight cars, against 8642 in January. The decline is ascribed to smaller steel allocations. In

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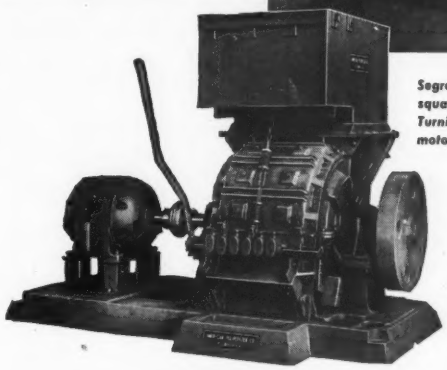

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STRUCTURAL SHAPES . . .

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935 tons, frame and substructure, Napolean avenue wharf, New Orleans, to Jones & Laughlin Steel Corp., New Orleans.

150 tons, rectifier plant for Kaiser Aluminum & Chemical Co., Tacoma, Wash., to Pacific Car & Foundry Co., Renton, Wash.

135 tons, substation steel for Bonneville Power Administration, Portland, Oreg., to Creamer & Dunlap, Tulsa, Okla.

100 tons, prefabricated buildings for Yugoslavia and Alaska, to Leckenby Structural Steel Co., Seattle.

100 tons, shapes and bars, school building, Glastonbury, Conn., to City Iron Works Inc., Scherer Steel Co., and Wadhams & May, Hartford, Conn., general contractors.

100 tons, shapes and bars, school building, Newton, Conn., to Port Chester Iron Works, Port Chester, N. Y., and Fireproof Products Corp., New York; E. & F. Construction Co., Bridgeport, Conn., general contractor.

100 tons, shapes and bars, plant addition, Pitney-Bowes Inc., Stamford, Conn., to Leake, Nelson Co., Bridgeport, Conn., and Fireproof Products Corp., New York; Vuono Construction Co., Stamford, general contractor.

STRUCTURAL STEEL PENDING

3880 tons, superstructure, contract C-2B, John F. Fitzgerald Expressway, Boston; bids Mar. 25.

500 tons, including 250 for powerhouse, Albeni Falls, Idaho, power project; bids in.

390 tons, Eielson air field, Alaska, field house; bids in Mar. 12.

340 tons, plate girder bridge, railroad relocation, McNary dam project; J. A. Terteling & Sons, Boise, Idaho, low to U. S. Engineer, Walla Walla, Wash., $1,280,797.

150 tons, state highway bridge, Raynham, Mass., J. F. Fitzgerald Construction Co., Boston, low.

100 tons, Hungry Horse, Montana, bridges; bids to Bureau of Reclamation, Columbia Falls, Mont., Apr. 8.

PIPE . . .

CAST IRON PIPE PLACED

550 tons, 6 to 12-inch cast iron pipe, Portsmouth, N. H., to Warren Pipe & Foundry Co., Everett, Mass.

100 tons plus, water line for Sunnyside, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

CAST IRON PIPE PENDING

200 tons, 12 to 6 inch; bids to D. W. Carpenter, clerk, Longview, Wash., Mar. 13.

Unstated, 17,000 feet, 12 inch replacement supply line; bids to U. S. Navy, Kodiak, Alaska, Apr. 10; #31604.

Unstated, 15,000 feet, 12 to 4 inch, also alternatives; bids to King county district No. 42, 16906 15th Ave. N. E., Seattle, Apr. 12.

REINFORCING BARS . . .

REINFORCING BARS PLACED

400 tons, power plant addition, Narragansett Electric Co., Providence, R. I., to Bethlehem Steel Co.; United Engineers & Constructors Inc., Philadelphia, contractor-engineer.

350 tons, hospital addition, Waterbury, Conn., to Bethlehem Steel Co., through W. J. Megin Inc., Naugatuck, Conn., general contractor.

REINFORCING BARS PENDING

6500 tons, Palisades dam and power plant, near Irwin, Idaho; bids Apr. 1 to Bureau of Reclamation, Idaho Falls, Idaho. Job also requires 850 tons, tunnel supports.

4000 tons, Albeni Falls power project, Pend Oreille river, Idaho; low joint bid, $8,607,246 by Donovan-Foley-Winston-Lytle-James, St. Paul, to U. S. Engineer, Seattle.

385 tons, bridge substructure, Chicopee-West Springfield, Mass.; bids Mar. 25, Boston.

345 tons, including 125 tons mesh, traffic interchange, Cranston and Warwick, R. I.; bids Mar. 19, Providence, R. I.

325 tons, four double-span concrete bridges, Marsh brook, Stockbridge-West Stockbridge, Mass.; bids Mar. 18.

165 tons, bridge substructure, Lowell, Mass.; Allied Engineering Corp., Roxbury, Mass., low.

PLATES . . .

PLATES PLACED

600 tons, storage tanks for Shell Oil Co., Portland, Oreg., to Consolidated Western Steel Corp., Seattle.

100 tons plus, two water storage tanks, Wolf Creek district, Portland, Oreg., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

PLATES PENDING

15,000 tons (estimated) 25.5 mile Bull Run supply line, 66 to 52 inch diameter; bids to Portland, Oreg., Mar. 14.

350 tons, two-mile supply line for Everett, Wash.; steel alloted for second quarter; bids soon.

100 tons plus, 200,000-gallon storage tank, Larson Air Force base, Spokane, Wash.; bids to U. S. Engineer, Walla Walla, Mar. 13.

RAILS. CARS . . .

LOCOMOTIVES PLACED

Central Railways of Brazil, forty 107-ton diesel-electric locomotives, to Erie, Pa., plant of International General Electric Co.; each locomotive will be powered with a 1600-hp American Locomotive Co. engine.

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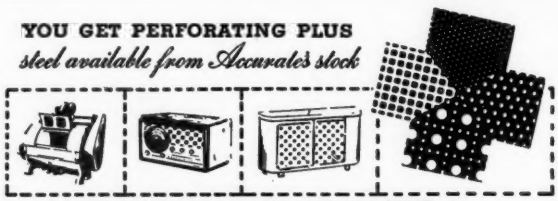

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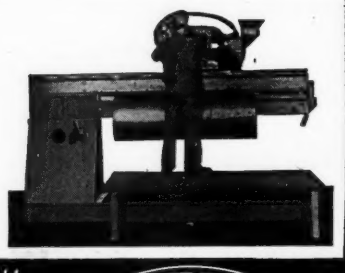

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CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Brassert & Co. Reorganized

Reorganization of H. A. Brassert & Co. was announced by Herman A. Brassert, who will serve as chairman of the board. Franklin C. Senior is president. James E. Brassert and David Knall will be officers of the company which has offices in Birmingham and New York. The company is continuing its activities as engineers to the iron and steel industry and will cover the fields of mining, raw materials and ore preparation, pelletizing, blast furnace, steel plants and rolling mills.

The firm of Senior, Juengling & Knall is continuing its activities in the southeastern states. The combined engineering and drafting operations will be handled in the Birmingham office.

C. A. Brassert, president of Standard Boiler & Plate Iron Co., Pittsburgh, announces that this company is taking over the activities of H. A. Brassert Co. of Pittsburgh which is being liquidated.

Townsend Builds Rivet Plant

Townsend Co., New Brighton, Pa., is building a $500,000 plant for its Cherry Rivet Co. Division at Santa Ana, Calif. The fact that as many as a quarter million Cherry rivets are used in building one superbomber demonstrates how important these rivets are in modern aircraft construction.

Hydraulic Institute Elects

J. N. McComb, controller, Goulds Pumps Inc., Seneca Falls, N. Y., was elected president of Hydraulic Institute, New York. Britton L. Gordon, president, Blackmer Pump Co., Grand Rapids, Mich., was elected vice president of the institute.

Sells Gray Iron Foundry

Hall-Watson Co., Taunton, Mass., is selling its gray iron foundry equipment. An affiliated company, Bay State Stove Co., will take the additional space at this Taunton plant. Castings formerly made there will be poured by Seaboard Foundry Inc., Johnston, R. I.

Albany Foundries on Block

Two Bell foundries in the Albany, N. Y., area ceased operations because of a lack of tin and copper and the plants are up for sale. Meneely & Company Inc., Watervliet, N. Y., and Meneely Bell Co., Troy, N. Y., are the two concerns. Meneely & Company Inc. was founded in 1826. Its plant is a 20,000 square foot building and connected foundry. Meneely Bell Co. was opened independently by a different branch of the family in 1869. Its plant has about 12,000 square feet of space.

Keller Machine Co. Expands

J. A. Keller Machine Co., Tonawanda, N. Y., is completing a $100,000 expansion program in its plant, which it established last summer. About 60 per cent of the company's production is in defense and defense-supporting work.

Koppers To Build Coke Ovens

Jones & Laughlin Steel Corp., Pittsburgh, awarded a contract to Koppers Co. Inc., that city, to design and build a battery of chemical-recovery coke ovens at its Hazelwood plant, Pittsburgh.

Pyron Plans To Boost Output

Pyron Corp., Niagara Falls, N. Y., rented additional factory space where it will double its output of hydrogen-reduced iron powder. The company plans to acquire nearly $500,000 worth of new equipment and production in the new quarters is expected to begin in July.

Dollinger Appoints Agents

Dollinger Corp., Rochester, filter manufacturer, appointed Sabel E. Baum, Dixie Engineering Co., Birmingham, and Roy A. Stipp, Greenville, S. C., as representatives in their respective territories.

New Plant To Make Presses

Canadian Siempelkamp Ltd., which plans to establish operations in Hamilton, Ont., will produce heavy industrial presses. The German firm contracted to purchase 10 acres of property in the Hamilton area for its new plant. The company is receiving more than 500 tons of machinery from Germany in May.

Cross Enlarges Facilities

Plans for greatly expanding its facilities for manufacturing machine tools is announced by Cross Co., Detroit. Over 33,000 square feet of floor space was added by the purchase of a building at Mack and Bellevue, across the street from its main plant. Another factory at 9527 Traverse also is occupied by Cross. Remodel-

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A 5921-1E

ing of the newly acquired building is expected to be completed by Apr. 1. Over $1 million worth of new machinery is being installed. Production this year is expected to be increased by at least 50 per cent over 1951.

Bliss & Laughlin Expands

Bliss & Laughlin Inc., will start construction early next month on an addition to a building in its Harvey, Ill., plant. This building houses furnace treating equipment which is used for annealing, normalizing or stress relieving, either hot-rolled or cold-finished steel bars.

Simmons Dedicates Plant

Simmons Co., Chicago, dedicated its newest plant in Dallas. This plant accommodates straight-line mechanized production of bedding equipment to be manufactured for direct distribution to markets in the Southwest.

Aviation Firm Leases Space

North American Aviation Inc., Los Angeles, leased 10,000 sq ft of floor space at 8426 Firestone Blvd., Downey, Calif., for use by 100 engineers in its electro-mechanical department.

Safety Socket Boosts Output

Less than 1½ years after opening its new plant, Safety Socket Screw Co., Chicago, completed additional plant construction which increases its production facilities by more than 25 per cent.

Udylite Builds Laboratory

Udylite Corp. will start construction on a research laboratory building on Hoover avenue near Eight Mile road, Detroit, as soon as weather conditions permit. The building is designed to provide complete facilities for every phase of research on electroplating and metal finishing processes.

Turbo Products To Expand

Turbo Products, Pacoima, Calif., will start construction of a plant at Wilmington and San Pedro road, Wilmington, Calif., for manufacture of aircraft parts.

Oakite Products Inc. Moves

Oakite Products Inc. moved to 19 Rector St., New York. The larger quarters permit this manufacturer of specialized cleaning and allied materials to increase facilities of its chemical research and engineering laboratories.

Torrington Builds Plant

Torrington Mfg. Co.-Western Division, Los Angeles, subsidiary of Torrington Mfg. Co., Torrington, Conn., manufacturer of fan blades and air impellers, constructed a plant at 15001 Oxnard St., Van Nuys, Calif.

Cleaver-Brooks Names Agent

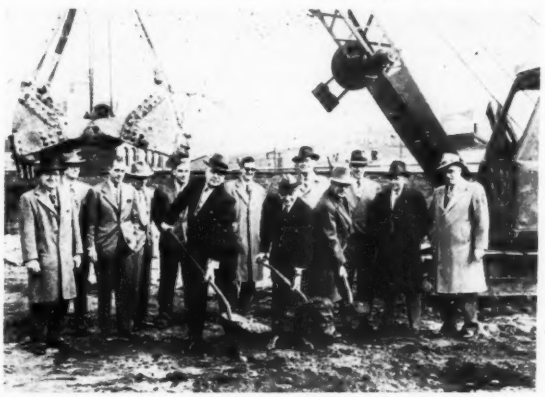
Cleaver-Brooks Co., Milwaukee, appointed E. C. Giberson, Des Moines, Iowa, as its representative in that territory. Cleaver - Brooks manufactures equipment for the generation and utilization of heat.

Fire Damages Bolton Foundry

Bolton Foundry, Bolton, Ont., was damaged by fire with loss estimated at $75,000. The foundry is owned by Howard Furnace & Foundries Ltd., Toronto. A company official said it is not known whether the company will rebuild the plant which turned out iron and aluminum castings.

Quality Steels To Be Sold

Upon a judicial sale supervised by the master of the supreme court of Ontario, tenders will be con-



Wheeler Breaks Ground for Philadelphia Addition

Officials of the C. H. Wheeler Mfg. Co. break ground for a $600,000 addition to its Philadelphia plant. The 300-foot building will house 30-ton cranes and machine tools for increased volume of condenser, pump and naval deck machinery, plus a test laboratory

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What Happened to That Pint of Blood You Were Going to Give?

sidered for the sale of the land, buildings and equipment of Quality Steels Canada Ltd., London, Ont. The vendor is Guaranty Trust Co. of Canada. Tenders will close Apr. 15. The plant was closed down in November, 1948, due to lack of working capital.

Endicott Coil Co. Expand.

Endicott Coil Co., Endicott, N. Y., purchased a building in Binghamton, N. Y., and will take possession about Sept. 1. The new location will give the firm about three times its present floor space for its electronic assembly activities.

Ansul Moves Branch Offices

Ansul Chemical Co., Marinette, Wis., moved its Fire Extinguisher Division's branch offices to 17184 Wyoming, Detroit, and to 2755 N. Third St., Milwaukee.

Schaible Purchases Plant

Schaible Co., Cincinnati, manufacturer of plumbing and heating equipment, purchased a plant formerly owned by Emery Industries Inc. in suburban Mariemont. The plant will house manufacturing and executive offices and will be opened around the end of this year.

Cleco Appoints Distributors

Cleco Division, Reed Roller Bit Co., Houston, appointed Arrow Supply Co. Inc., Pittsburgh; Peerless Supply Co., Des Moines; and Bates Supply Co., Quincy, Mass., as distributors for its air tools and accessories.

Kidde Erecting Building

Walter Kidde & Co. Inc., Belleville, N. J., is constructing an engineering and development building which will house model shops, development and testing laboratories and general engineering offices.

Aluminum Extruder to Build

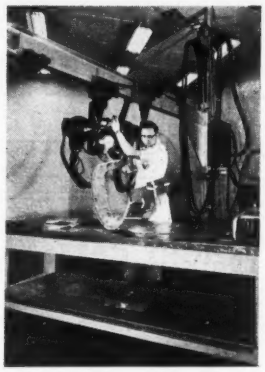
General Extrusions Co., a new aluminum firm in Youngstown, plans to build a plant addition and to fabricate and extrude aluminum products.

Erie Plans Maintenance Shop

Erie Railroad plans to build a diesel-electric locomotive maintenance shop at its Brier Hill yards in Youngstown. Cost is estimated at between $1 million and $1.5 million.

Janette Increases Output

Janette Electric Mfg. Co., Chicago, is operating its $1.5 million plant at Lehigh and Main streets, Morton Grove, Ill. The plant houses the company's executive offices and complete production operation. Additional machine tools and other precision equipment have been installed to increase output of electric motors and speed reduction equipment.



Buck Rogers: 1952 Style

This Buck Rogers type gadget is really a 25,000-volt Westinghouse X-ray unit in the new laboratories at Texas Engineering & Mfg. Co. Inc., Dallas. The lab can process 79,000 square feet of film in an 8-hour workday

Link Leases Building

Link Aviation Inc., Binghamton, N. Y., leased a 20,000 square foot building at 119 Montgomery St. The new facility will be used primarily for inventory storage of heavy materials and some light manufacturing.

Hersey To Expand on Coast

Hersey Mfg. Co., South Boston, Mass., procured two acres in the Alhambra-Monterey Park industrial center near Los Angeles as a site for construction of a plant to manufacture water meters.

A. Milne Moves Coast Office

A. Milne & Co., solid and hollow tool steel distributors, New York, moved its San Francisco sales office and warehouse to larger quarters at 540 First St.

Refrigerator Plant Damaged

Fire recently destroyed a portion of McCall Refrigerator Corp.'s plant in Albany, N. Y., causing damage estimated at more than $500,000. A large quantity of materials and machine tools were destroyed in the blaze.

Colonial Iron Names Agent

Colonial Iron Works Co., Cleveland, appointed Hayden & Co., Chicago, as its representative in the Chicago area. Colonial is a fabricator of special processing equipment of practically all of the commercially available wrought corrosion-resistant metals and alloys, solid or as clad metals.

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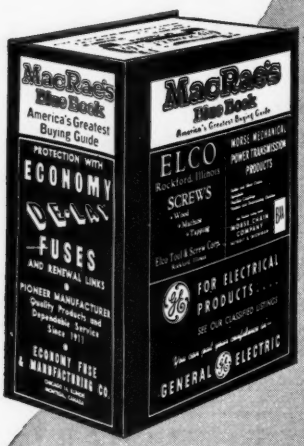

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